Contributions personnelles en matière de soins de santé en Belgique. L'impact des suppléments

KCE reports vol. 50B

Federaal Kenniscentrum voor de gezondheidszorg
Centre fédéral d'expertise des soins de santé
2006

Le Centre fédéral d'expertise des soins de santé

Présentation : Le Centre fédéral d'expertise des soins de santé est un parastatal, créé le 24 décembre 2002 par la loi-programme (articles 262 à 266), sous tutelle du Ministre de la Santé publique et des Affaires sociales, qui est chargé de réaliser des études éclairant la décision politique dans le domaine des soins de santé et de l'assurance maladie.

Conseil d'administration

Membres effectifs : Gillet Pierre (Président), Cuypers Dirk (Vice-Président), Avontroodt Yolande, De Cock Jo (Vice-Président), De Meyere Frank, De Ridder Henri, Gillet Jean-Bernard, Godin Jean-Noël, Goyens Floris, Kesteloot Katrien, Maes Jef, Mertens Pascal, Mertens Raf, Moens Marc, Perl François Smiets Pierre, Van Massenhove Frank, Vandermeeren Philippe, Verertbruggen Patrick, Vermeyen Karel

Membres suppléants : Annemans Lieven, Boonen Carine, Collin Benoît, Cuypers Rita, Dercq Jean-Paul, Désir Daniel, Lemye Roland, Palsterman Paul, Ponce Annick, Pirlot Viviane, Praet Jean-Claude, Remacle Anne, Schoonjans Chris, Schrooten Renaat, Vanderstappen Anne,

Commissaire du gouvernement : Roger Yves

Direction

Directeur général : Dirk Ramaekers

Directeur général adjoint : Jean-Pierre Closon

Contact

Centre fédéral d'expertise des soins de santé (KCE).
Rue de la Loi 62
B-1040 Bruxelles
Belgium

Tel: +32 [0]2 287 33 88
Fax: +32 [0]2 287 33 85

Email : info@centredexpertise.fgov.be
Web : http://www.centredexpertise.fgov.be

Contributions personnelles en matière de soins de santé en Belgique. L'impact des suppléments.

KCE reports vol. 50B

DIANA DE GRAEVE, ANN LECLUYSE, ERIK SCHOKKAERT, TOM VAN OURTI, CARINE VAN DE VOORDE

Federaal Kenniscentrum voor de gezondheidszorg
Centre fédéral d'expertise des soins de santé
2006

KCE reports vol. 50B

Titre :	Contributions personnelles en matière de soins de santé en Belgique. L'impact des suppléments.
Auteurs :	Diana De Graeve (UA), Ann Lecluyse (UA), Erik Schokkaert (KULeuven), Tom Van Ourti (Erasmus Universiteit Rotterdam), Carine Van de Voorde (KCE)
Experts externes:	Katrien Kesteloot (UZ Leuven), Hugo Casteleyn (A.Z. Sint-Blasius Dendermonde), Guy Durant (Cliniques Universitaires St-Luc), Fred Louckx (VUB), Vincent Lorant (UCL), Xander Koolman (Erasmus Universiteit Rotterdam), Tom De Boeck (NVSM), Tonio Di Zinno (NVSM), Rebekka Verniest (LCM), Koen Vleminckx (FOD Sociale Zekerheid), Alex Maselis (Assuralia), Mark Leys (KCE)
Validateurs :	Myriam De Spiegelaere (ULB), Eddy van Doorslaer (Erasmus Universiteit Rotterdam), Joeri Guillaume (UNMS)
Conflict of interest :	Joeri Guillaume a été impliqué dans la collecte de données AIM.
Disclaimer :	Les experts externes et validateurs ont collaboré à la rédaction du rapport scientifique mais ne sont pas responsables des recommandations aux Autorités. Les recommandations aux Autorités ont été rédigées par le Centre d'Expertise (KCE).
Layout :	Dimitri Bogaerts, Patrice Chalon

Bruxelles, janvier 2007

Etude nr 2004-21
Domaine : Equity and Patient Behaviour (EPB)

MeSH : Financing, Personal ; Health Services Accessibility ; Insurance, Hospitalization
NLM classification : W74

Langage : français, anglais

Format : Adobe® PDF™ (A4)

Dépôt légal : D/2006/10.273/69

La reproduction partielle de ce document est autorisée à condition que la source soit mentionnée. Ce document est disponible en téléchargement sur le site Web du Centre fédéral d'expertise des soins de santé.

Comment citer ce rapport ?
De Graeve D, Lecluyse A, Schokkaert E, Van Ourti T, Van de Voorde C. Contributions personnelles en matière de soins de santé en Belgique. L'impact des suppléments. Equity and Patient Behaviour (EPB). Bruxelles: Centre fédéral d'expertise des soins de santé (KCE); 2006. KCE reports 50 B (D/2006/10.273/69)

PREFACE

L'accès aux soins de santé pour tous demeure un principe de base dans notre pays. Cette accessibilité se caractérise principalement par la hauteur des contributions personnelles auxquelles sont soumises les patients. Combien le patient doit-il sortir de sa poche pour un séjour à l'hôpital ou une consultation chez le médecin ? Pour partie, ces contributions personnelles consistent en tickets modérateurs (différence entre le tarif conventionné et le tarif de remboursement). Les tickets modérateurs sont fixés par l'Etat et des mécanismes tel le Maximum à Facturer sont prévus explicitement afin de protéger les patients de montants annuels trop élevés en tickets modérateurs. Viennent cependant s'ajouter aussi les suppléments, c'est à dire la différence entre le tarif réel et le tarif conventionné pour les prestations reprises dans l'assurance obligatoire ou le prix total de prestations non couvertes par l'assurance. Bien que la hauteur des suppléments soit quelque peu réglementée, les hôpitaux et les prestataires disposent encore d'une grande liberté pour les fixer.

De nombreux indices montrent que ces suppléments ont fortement augmenté ces dernières années, avec des conséquences immédiates sur l'ampleur des contributions personnelles à charge du patient. Bien sûr, certains patients sont protégés pour une grande partie de ces frais par leur assurance soins de santé complémentaire. Mais qu'il s'agisse d'une augmentation de la contribution personnelle du patient ou d'une multiplication des assurances complémentaires, on se dirige à tout coup vers une privatisation croissante du système.

Cette évolution peut avoir diverses causes, qui sont toutes en relation avec le mode de financement actuel de l'assurance maladie obligatoire. La présente recherche n'avait pas pour ambition d'identifier ces causes. Son objectif principal était à la fois de cerner les conséquences sociales de cette évolution et de dresser un aperçu de la répartition des suppléments dans la population de la manière la plus complète possible. Qui paye des suppléments ? Qui demande des suppléments?

Au cours de ce projet, les chercheurs ont été confrontés de façon aiguë aux limitations des données disponibles. Ces limites ont rendu difficile l'esquisse d'une image exhaustive. Ceci constitue aussi un problème pour les décideurs qui, comme les patients, sont forcément confrontés à ce manque de transparence.

Les résultats de ce projet ne permettent pas d'émettre un jugement quant aux avantages et inconvénients d'une privatisation croissante en général et d'une augmentation des suppléments en particulier. Ils suggèrent cependant que leur évolution doit être suivie scrupuleusement. Plus de liberté dans la fixation des prix, un plus grand rôle des assurances complémentaires et une augmentation de la contribution personnelle des patients constituent des changements importants dans la structure de notre système. Seul un débat de société plus ouvert au cours duquel les avantages et les inconvénients de cette évolution seraient mis en lumière, permettra d'avancer.

Jean-Pierre CLOSON
Directeur général adjoint

Dirk RAMAEKERS
Directeur général

EXECUTIVE SUMMARY

INTRODUCTION

Les paiements à charge des patients se composent du ticket modérateur (la différence entre la base de remboursement utilisée par l'INAMI et le tarif de remboursement) et des suppléments (la différence entre l'honoraire ou le prix réellement payé par le patient et la base de remboursement utilisée par l'INAMI). Est également inclus dans la contribution personnelle du patient l'intégralité du montant des frais médicaux qui sont supportés par le patient mais qui ne sont pas repris dans le paquet de l'assurance maladie obligatoire. Tombent dans cette catégorie aussi bien les frais médicaux non couverts par l'assurance (comme certains implants ou médicaments de catégorie D) que divers postes de la facture hospitalière pour des biens et services non médicaux, comme la télévision ou le téléphone. Bien qu'il ne s'agisse pas ici de suppléments au sens strict, ces contributions peuvent aussi être interprétées comme des suppléments au sens large. Un haut niveau de contributions personnelles peut compromettre l'accessibilité financière des soins de santé pour les groupes de population plus faibles.

Plusieurs études récentes démontrent que les hôpitaux demandent de plus en plus de suppléments, lesquels sont également toujours plus élevés. Ainsi, les suppléments pour la période 2002-2004 auraient-ils augmenté de 21 %. Cette augmentation sensible est due principalement aux suppléments d'honoraires et aux suppléments sur le matériel. C'est assez inquiétant, étant donné que les mesures de protection existantes ont principalement trait au ticket modérateur et, dans une moindre mesure, aux suppléments.

Les hôpitaux justifient l'augmentation des suppléments par le sous financement. Notre recherche n'a toutefois pas porté sur les causes de l'augmentation – sur base des données disponibles, ce n'était d'ailleurs pas possible - mais plutôt sur ses conséquences sociales. D'où notre choix d'une définition des suppléments qui incluent même les coûts médicaux non couverts par l'assurance maladie. Il convient de souligner que cette définition a pour objectif d'approcher le mieux possible les contributions personnelles à charge des patients au-delà des tickets modérateurs et qu'elle est donc plus large que celle d'un supplément au sens strict compris comme « le montant à payer en sus du ticket modérateur pour des prestations couvertes par l'assurance maladie ».

Nous avons analysé l'ampleur et les déterminants des suppléments. Parmi les questions de la recherche, citons : quelle est la hauteur des suppléments ? Quel est le lien entre les suppléments payés et le ticket modérateur payé ? Qui paie les suppléments ? Sur quoi les suppléments sont-ils payés ? Sont ils en liaison avec le comportement des prestataires de soins et les hôpitaux ? Quel est l'impact d'une assurance hospitalisation complémentaire ?

Données et méthodes

Pour répondre aux questions de la recherche, nous avons utilisé un ensemble de données administratives contenant des informations sur un échantillon de quelque 300,000 individus en 2003. L'ensemble de données contient tant des données démographiques que socio-économiques (limitées), ainsi que des données relatives aux dépenses (remboursements AMI, tickets modérateurs et suppléments pour les agrégats de soins). Toutes ces données sont disponibles au niveau individuel et ventilées par hospitalisation. Nous disposons également d'un ensemble de données complémentaire avec des informations limitées sur les hôpitaux.

L'ensemble de données présente plusieurs lacunes importantes. Nous ne possédons pas d'informations sur les revenus de l'individu ni sur la présence d'une assurance hospitalisation complémentaire. De même, les informations sur la morbidité sont limitées. En outre, l'enregistrement des suppléments dans le secteur ambulant est moins fiable que l'enregistrement des suppléments en hospitalisation, car les données sont incomplètes. L'information sur les soins non couverts par l'assurance dans le secteur ambulatoire fait totalement défaut.

Nous utilisons principalement des statistiques descriptives et des méthodes de régression pour répondre aux questions de la recherche. Pour expliquer l'ampleur des suppléments, nous distinguons quatre groupes de facteurs : indicateurs de morbidité, différences de réglementation, facteurs d'offre et choix personnel des patients. La réglementation et les résultats sont relatifs à l'année 2003.

Réglementation des suppléments dans le secteur de la santé

En Belgique, en ce qui concerne les prestations couvertes par l'assurance maladie, des suppléments sont portés en compte en sus des tickets modérateurs officiels pour les honoraires, la chambre et le matériel. Il existe certes une réglementation de protection. Les médecins non conventionnés peuvent facturer des suppléments d'honoraires dans tous les types de chambres, mais les groupes fragiles spécifiques bénéficient d'une protection en chambre double et en chambre commune. Les médecins conventionnés peuvent facturer des suppléments d'honoraires uniquement dans les chambres particulières. Des suppléments de chambre peuvent être facturés dans les chambres à un et deux lits, certes plafonnés dans le dernier cas. La mesure dans laquelle des suppléments de matériel peuvent être portés en compte est fonction du type d'implant, sans protection spécifique de certains groupes. Pour les frais médicaux non couverts par l'assurance, il n'y a pas de réglementation de protection spécifique.

LA REPARTITION DES SUPPLEMENTS DANS LA POPULATION

Qui paie tel ou tel supplément?

Une extrapolation des données de l'échantillon indique que 60% de la population belge n'a pas payé de supplément en 2003, et 18 autres pour-cent ont payé moins de 10 euros. En moyenne, les personnes reprises dans l'échantillon n'ont payé que €61 de suppléments. Toutefois, le nombre de patients devant payer des suppléments élevés (>€500) et très élevés (>€1,000) n'est pas négligeable ; il s'agit respectivement de 296,000 et 137,000 individus. Les suppléments sont vraisemblablement plus fréquents en cas d'hospitalisation que dans le secteur ambulatoire. En général, nous observons une corrélation positive entre les suppléments et les tickets modérateurs payés. Le tableau ci-dessous donne la répartition des suppléments et des tickets modérateurs dans la population. Dans ce tableau, on a tenu compte des remboursements effectués dans le cadre du système du Maximum à Facturer. En outre le nombre d'individus supportant un certain niveau de tickets modérateurs et de suppléments est ventilé en fonction du total de leurs contributions personnelles (càd la somme des tickets modérateurs et des suppléments). Les cellules blanches donnent le nombre de personnes avec des contributions personnelles inférieures à €500. Les cellules jaunes donnent le nombre de personnes qui, au cours de l'année 2003 ont dû faire face à au moins €500 de contributions personnelles. Les cellules brunes donnent la même information pour les contributions personnelles d'au moins €1000.

Répartition des suppléments et des tickets modérateurs dans la population en 2003 (nombre d'individus)

Ticket modérateur en € (correction MàF)	Contributions personnelles*	Suppléments en €					
		0-100	100-250	250-500	500-1000	>1000	Total
0-100	Faibles	5,192,320	27,060	8,120	0	0	5,227,500
	Elevées	0	0	1,980	3,680	0	5,660
	Exorbitantes	0	0	0	360	3,660	4,020
100-250	Faibles	2,164,580	72,600	13,920	0	0	2,251,100
	Elevées	0	0	22,360	20,880	0	43,240
	Exorbitantes	0	0	0	6,480	13,600	20,080
250-500	Faibles	830,360	41,440	0	0	0	871,800
	Elevées	43,680	74,240	63,960	21,880	0	203,760
	Exorbitantes	0	0	0	50,400	47,500	97,900
500-1000	Faibles	0	0	0	0	0	0
	Elevées	186,680	50,800	19,960	0	0	257,440
	Exorbitantes	1,600	6,420	24,180	44,220	51,040	127,460
> 1000	Faibles	0	0	0	0	0	0
	Elevées	0	0	0	0	0	0
	Exorbitantes	16,660	9,300	9,800	11,080	21,160	68,000
Total	Faibles	8,187,260	141,100	22,040	0	0	8,350,400
	Elevées	230,360	125,040	108,260	46,440	0	510,100
	Exorbitantes	18,260	15,720	33,980	112,540	136,960	317,460

* Les contributions personnelles (CP) sont constituées de la somme des tickets modérateurs et des suppléments. Faibles, élevées et exorbitantes se réfèrent respectivement à CP<€500; €500≤CP<€1,000 en CP≥€1,000.

Une fonction en forme de U relie l'âge et les suppléments payés, avec un coût plus élevé pour les femmes dans la tranche d'âge 25-35 ans. Les suppléments augmentent de manière significative au cours de la dernière année de vie. Les handicapés, invalides, personnes avec incapacité de travail primaire et malades chroniques paient au total des suppléments plus élevés, mais l'augmentation des suppléments est moins prononcée que l'augmentation des dépenses AMI. Les personnes bénéficiant d'une intervention majorée semblent relativement bien protégées contre des contributions personnelles trop importants.

Une analyse différenciée pour les différentes catégories de soins fournit une image plus affinée. Alors que la majeure partie des patients ne paie pas de suppléments dans le secteur ambulatoire, les suppléments paramédicaux peuvent être importants pour ceux qui doivent en payer. En hospitalisation, les suppléments deviennent plus élevés et plus fréquents. Par hospitalisation, les contributions personnelles s'élevaient en moyenne à €421 en 2003, dont €262 de suppléments. Ces montants moyens se répartissent cependant de manière très différente dans la population. Les catégories principales sont les suppléments de chambre (€70) et les suppléments d'honoraires (€112). Le supplément moyen pour une intervention chirurgicale s'élève à pratiquement 100% du prix officiel (remboursement + ticket modérateur) ; pour la gynécologie et les implants, ces pourcentages sont encore plus élevés (respectivement 114% et 243% du prix officiel).

Les suppléments sont fortement différenciés suivant le type de chambre. C'est dans les chambres particulières que les suppléments les plus élevés sont demandés (plus de €800) ; ce supplément est nettement moins élevé dans les chambres à deux lits (>€200) et les chambres communes (+/-€70). La composition des suppléments est très différente en fonction du type de chambre et du statut du patient. Les patients avec

intervention majorée paient en moyenne par séjour dans chaque type de chambre autant que les patients sans intervention majorée. La durée plus élevée de leurs séjours annule l'effet protecteur de la réglementation. Leurs suppléments globalement moins élevés s'expliquent donc totalement par le choix de la chambre : 8% seulement des admissions de personnes avec intervention majorée se font en chambre particulière (pour 25% pour les personnes sans intervention majorée).

Répartition des suppléments en fonction du type de chambre et du statut du patient en 2003

Type de chambre	Intervention majorée	% de choix de chambre[a]	Suppléments par séjour (€)	Suppléments par jour (€)
Particulière	Non	25	847	162
¨Particulière	Oui	8	899	111
A deux lits	Non	19	251	52
A deux lits	Oui	20	237	26
Commune	Non	51	71	16
Commune	Oui	67	79	9

Répartition des tickets modérateurs en fonction du type de chambre et du statut du patient en 2003

Type de chambre	Intervention majorée	% de choix de chambre[a]	Tickets modérateurs par séjour €)	Tickets modérateurs par jour (€)
Particulière	Non	25	179	30
Particulière	Oui	8	154	10
A deux lits	Non	19	184	33
A deux lits	Oui	20	105	11
Commune	Non	51	176	30
Commune	Oui	67	133	9

Qui porte en compte les suppléments?

Les suppléments hospitaliers sont bien plus élevés à Bruxelles, Liège et (dans une moindre mesure) dans le Luxembourg. Les plus grosses différences se situent au niveau des suppléments d'honoraires et de chambre. Dans un hôpital bruxellois, le prix d'une chambre à un lit est en moyenne environ €50 par jour plus élevé qu'à Anvers. Les suppléments d'honoraire en chirurgie en chambre particulière sont de 40 à 60% plus élevé à Bruxelles et à Liège qu'à Anvers. Dans les hôpitaux psychiatriques, les suppléments de chambre par jour sont significativement moins élevés que dans les hôpitaux aigus. Les suppléments en médecine ambulatoire sont les plus élevés à Anvers, et les plus faibles en Wallonie, à Bruxelles et dans le Limbourg. La prudence est ici toutefois de mise : nos données sur le secteur ambulatoire sont incomplètes, notamment en raison du caractère facultatif de l'enregistrement des suppléments sur honoraires médicaux.

Hospitalisations, choix des chambres et suppléments

Les groupes plus faibles sur le plan socio-économique, y compris les personnes avec régime préférentiel, paient moins de suppléments que d'autres groupes, toutes choses égales par ailleurs en termes d'âge, de sexe, de résidence, etc. Ils ont pourtant tout autant de chance de se faire admettre à l'hôpital. Leurs suppléments moins élevés ne peuvent donc pas être expliqués de cette manière. Les différences au niveau du choix de la chambre sont déterminantes. En moyenne sur l'ensemble de la population,

[a] La somme des pourcentages n'atteint pas 100% car pour un certain nombre d'admissions, le choix de chambre n'est pas encodé.

quelque 58% des patients optent pour une chambre commune, 21% pour une chambre à deux lits et 20% pour une chambre particulière. Les invalides, handicapés, patients avec intervention majorée et issus de groupes socio-économiques plus faibles sont hospitalisés relativement plus souvent en chambre commune. Ni les différences sur le plan de la fréquence d'admission ni les différences sur le plan du choix de la chambre ne peuvent expliquer les suppléments d'hospitalisation plus élevés à Bruxelles, dans le Brabant wallon et à Liège. L'explication doit vraisemblablement être cherchée au niveau du comportement de tarification différent des hôpitaux dans ces provinces.

La position des groupes sociaux particuliers

Il ressort des résultats que les malades chroniques paient d'une manière générale des suppléments plus élevés. En raison de l'absence de données de pathologies, nous ne pouvons identifier dans nos données qu'un nombre limité de pathologies chroniques. En comparaison avec la population totale, les diabétiques et (surtout) les dialysés paient des suppléments plus élevés, tant dans le secteur ambulatoire que dans le secteur hospitalier. Les patients dialysés paient en moyenne plus de €800 en suppléments. Les patients en hôpital psychiatrique aussi paient des suppléments plus élevés par admission. Cela peut s'expliquer par leur durée d'hospitalisation plus longue : celle-ci est près de 10 fois plus longue que dans un hôpital aigu et 4 fois plus longue que dans un hôpital chronique.

En combinant les données de 2003 et celles de 2002, nous constatons que les décaissements sont corrélés positivement dans le temps. Un nombre non négligeable de personnes a dû payer des suppléments élevés tant en 2002 qu'en 2003 : 40,820 individus ont payé plus de €500 chacune de deux années et 16,020 individus ont payé plus de €1,000. Sur un peu plus de 1 million de personnes hospitalisées en 2003, un tiers d'entre eux avaient également été hospitalisées en 2002.

Enfin, nous examinons la position des indépendants n'ayant pas droit au remboursement pour les petits risques dans le cadre du système d'assurance obligatoire. En dépit de leur faible consommation de soins (également pour les gros risques), ils paient en moyenne 50% de suppléments en plus. Leur durée moyenne de séjour en hôpital est toutefois plus courte. La majeure partie des suppléments plus élevés s'explique là encore par le choix de la chambre. Les indépendants optent plus souvent pour une chambre individuelle. De plus, les suppléments payés par jour sont également plus élevés.

CONTRIBUTIONS PERSONNELLES ET ASSURANCE HOSPITALISATION COMPLEMENTAIRE

Le fait que nous négligions l'impact de l'assurance hospitalisation complémentaire constitue une lacune importante dans notre analyse des suppléments. Disposer ou non d'une assurance hospitalisation complémentaire détermine la véritable charge financière des suppléments élevés pour l'individu et joue incontestablement un rôle de premier plan dans l'explication du choix de la chambre qui semble revêtir une importance tellement importante.

Étant donné l'absence d'informations dans les données AIM, nous avons eu recours à d'autres sources de données. Dans l'enquête de santé 2001, 61% des adultes ont déclaré qu'ils disposaient d'une assurance hospitalisation complémentaire. L'analyse de ces données fait apparaître un gradient socio-économique très clair, selon lequel les personnes disposant de revenus plus élevés et ayant suivi une formation meilleure ont une plus grande probabilité de disposer d'une assurance complémentaire.

Pour se faire une première idée assez précise des effets de l'assurance hospitalisation sur le paiement des suppléments, nous avons procédé à deux simulations. *Une première méthode* consistait à imputer la présence d'une assurance complémentaire sur les données AIM sur la base d'un modèle très simplifié, utilisant des facteurs explicatifs de l'enquête de santé qui sont également présents dans les données AIM. *De façon alternative* il a été supposé que tous les individus en chambre particulière disposaient d'une assurance hospitalisation complémentaire. Toutes les autres personnes se sont

vues attribuer une assurance hospitalisation de manière aléatoire, de sorte qu'au total, 61% des personnes soient assurées de manière complémentaire. Ensuite, pour chacune des deux options, les tickets modérateurs et les suppléments ont été adaptés en considérant que les individus assurés bénéficiaient d'un "contrat type".

Les résultats de ce nouveau calcul ont pour conséquence, comme on pouvait s'y attendre, que le nombre de personnes devant faire face à des contributions personnelles élevées, est nettement moins important. Le nombre de personnes ayant des suppléments de plus de €1,000 diminue respectivement de 40% dans la première méthode et de 52% dans la deuxième. D'une manière générale, les effets de l'assurance sont les plus importants pour les personnes ayant des décaissements élevés. Ils le sont moins pour les personnes jouissant du régime préférentiel.

CONCLUSIONS ET RECOMMANDATIONS

Une conclusion générale qui ressort de cette étude est que la question des suppléments est particulièrement complexe et que de petites modifications dans la réglementation peuvent avoir un impact très important sur le patient ou sur l'hôpital. A la question de savoir si l'augmentation des suppléments constitue une menace en matière d'accessibilité financière, ce rapport apporte des réponses nuancées. Pour la plupart des gens qui rencontrent un problème médical aigu, la réponse est plutôt non. Pour ceux qui souffrent de maladie chronique et appartiennent à des groupes socio économiques défavorisés, la réponse est sans doute oui.

Il faut dès lors mettre en garde contre des conclusions simplistes et contre des mesures correctrices pour certains groupes, fragmentaires et prises trop rapidement sans avoir mis en question un certain nombre de caractéristiques fondamentales du phénomène des suppléments.

Quelques orientations générales de recommandations se dessinent néanmoins à l'issue de cette recherche.

Favoriser la transparence

On observe une grande variance dans les suppléments demandés par les différents hôpitaux. Ces différences ont trait tant au niveau qu'à la structure des suppléments. Pour les patients, il est difficile de comparer les prix. Ce manque de transparence entrave leur choix et entraîne parfois des surprises désagréables. Il rend également plus difficile la tâche des pouvoirs publics. Des règles non équivoques sur la manière dont les informations sur les suppléments doivent être communiquées aux pouvoirs publics, sont nécessaires. Plus de transparence et de sécurité juridique sont nécessaires dans la fixation des prix. Cette amélioration de la transparence doit également être poursuivie dans le secteur ambulatoire qui reste pour le moment largement obscur en raison de l'enregistrement facultatif de certains suppléments sur les honoraires médicaux ou sur le matériel médical.

De meilleurs mécanismes de protection

La réglementation actuelle en matière de suppléments utilise les critères administratifs disponibles en matière de fragilité socio-économique. Elle est différenciée suivant le type de chambre. Il n'existe aucune réglementation spécifique sur des suppléments dans le secteur ambulatoire.

Des mécanismes de protection plus affinés tenant compte des différences d'ampleur et de nature dans les suppléments à payer, pourraient être développés. Le système actuel du Maximum à Facturer ne protège que contre des tickets modérateurs élevés mais très peu contre les suppléments.

- L'ampleur des suppléments à payer est étroitement liée à la durée du séjour. Pour les malades chroniques (y compris les patients psychiatriques), l'addition totale peut s'avérer élevée, même s'ils jouissent du régime préférentiel. Les effets protecteurs de la réglementation pour les groupes qui en bénéficient sont compensés par une durée moyenne de séjour plus longue. Il est recommandé d'intégrer explicitement les informations sur la durée du séjour dans les prochaines mesures de protection. Cela devrait permettre une meilleure protection des patients chroniques.
- Un paiement unique de suppléments est bien moins problématique qu'un paiement répété. Pour éviter le cumul de suppléments élevés, les patients hospitalisés à répétition doivent être mieux protégés. Il est recommandé d'utiliser à cet effet les informations sur les contributions personnelles des patients pendant les années précédentes.
- La nature des suppléments revêt également une importance particulière du point de vue social. Lorsque des suppléments sont demandés pour des dépenses médicales non indispensables, ce n'est pas vraiment un problème. Les suppléments pour les dépenses de soins de santé nécessaires posent par contre problème, même lorsque ceux-ci ne doivent pas être payées par les groupes plus faibles sur le plan socio-économique. Les suppléments de matériel et de médicaments relèvent en bonne partie de cette dernière catégorie. La future réglementation devrait opérer une distinction explicite entre les dépenses indispensables et celles qui ne le sont pas. Cette distinction ne sera pas une sinécure. Comment qualifier par exemple un médicament obsolète ou un implant expérimental ? Laisser retomber la prise de décision sur les patients est une solution de facilité qui ne tient pas compte de l'asymétrie d'information et de la situation fréquente de dépendance dans laquelle se trouve le patient.

Dans la situation actuelle, le paiement des suppléments est étroitement lié au type de chambre. On observe une tendance singulière à la stratification sociale dans le choix de la chambre. Cette stratification sociale coïncide avec la stratification sociale dans l'assurance hospitalisation complémentaire. Quoi qu'il en soit, il convient de veiller à ce que la stratification sociale dans le choix de la chambre et les prix très différents des différents types de chambres ne débouchent pas sur des différences inacceptables de qualité de soins ou de services.

Nonobstant les données incomplètes dont nous disposions, nous avons pu constater que les suppléments dans le secteur ambulatoire constituent aussi une charge financière élevée pour certains patients. Ils coïncident en outre souvent avec des suppléments hospitaliers plus élevés. Une future réglementation sur les suppléments ne peut pas négliger ce phénomène.

Ces dernières années, les pouvoirs publics ont pris un certain nombre de mesures pour améliorer la protection contre des dépenses de santé trop élevées, surtout grâce à un élargissement du MàF. Depuis 2003, une série de mesure ont été prise qui rencontrent partiellement le problème d'une meilleure protection contre les suppléments, sans toutefois tenir compte explicitement du problème de la chronicité. Ainsi depuis 2003, le matériel endoscopique et de viscérosynthèse est devenu remboursable : cela va d'un minimum de 10% de remboursement sur 75% jusqu'à un remboursement intégral par l'assurance maladie. Le solde du coût est pris en compte au niveau du maximum à facturer. Il est important de noter que selon cette réglementation, tout matériel qui n'est pas repris dans la nomenclature est supposé être financé par le budget des moyens financiers des hôpitaux et ne peut donc en aucun cas être facturé au patient. Depuis

2006, la marge de délivrance sur les implants est également reprise dans la facture maximum. A partir de 2007, certains médicaments D seront remboursés à 20% pour certains groupes de patients et le reste sera intégré dans le compteur MàF de ces patients.

A côté des mesures MàF, les pouvoirs publics ont instauré des limites plus strictes à la possibilité pour les hôpitaux et les médecins (aussi bien conventionnés que non conventionnés) de facturer des suppléments de chambre ou d'honoraires dans les chambres communes ou à deux lits pour certains groupes de patients (ces mesures varient selon les groupes). De plus, dans la loi santé de 2006, une série de propositions concrètes sont formulées à propos des suppléments : instauration de maxima pour les suppléments d'honoraires en chambre particulière dans le règlement interne de l'hôpital, réglementation des suppléments en cas de rooming in (lorsqu'un parent loge avec l'enfant dans la chambre). De même, la nouvelle procédure de remboursement des implants et des dispositifs médicaux qui entre en vigueur à partir de 2007, va renforcer la sécurité tarifaire du patient. En particulier, la règle très désavantageuse pour le patient de l'article 28 (tarif de remboursement forfaitaire quel que soit le prix réel de l'implant), est appelée à disparaître.

Assurance hospitalisation complémentaire

La disponibilité d'une assurance hospitalisation complémentaire est actuellement liée aux revenus ainsi qu'au niveau de formation. Tant que ces assurances ne concernent que des soins médicaux non indispensables, elles ne constituent pas une menace directe pour l'équité en matière d'assurance maladie. Dans les autres cas, le système de sécurité sociale solidaire est menacé et on va vers une médecine à deux vitesses. Depuis 2003, le degré de couverture de la population en assurance hospitalisation complémentaire, a augmenté. On peut aussi s'attendre à ce que la stratification sociale évolue dans la mesure où un nombre toujours plus grand de personnes de plus de 65 ans va être assuré et pouvoir le rester. Néanmoins la question reste posée d'une réglementation claire prise par les pouvoirs publics pour améliorer l'accessibilité de tout un chacun à ces assurances complémentaires, si la couverture par un système public d'assurance maladie devait diminuer à l'avenir et si le rôle des assurances complémentaires devait s'accroître. Un débat de société sur un deuxième pilier en matière de soins de santé s'impose dans tous les cas.

Recherches complémentaires

Les analyses contenues dans ce rapport font apparaître des différences de prix significatives entre les hôpitaux. Facturer des suppléments peut augmenter le chiffre d'affaire des hôpitaux et améliore dès lors aussi leur situation financière. Mais est il vrai que les hôpitaux qui facturent les suppléments les plus élevés présentent systématiquement des résultats meilleurs que ceux qui n'en facturent pas ou très peu ? Pour identifier les causes de la santé financière des hôpitaux et isoler le rôle que les suppléments jouent à cet égard, une autre méthodologie de recherche serait nécessaire dans laquelle un examen complet de la gestion et des comptes (d'un échantillon) d'hôpitaux serait effectué. Pour cela, il faut rassembler des données détaillées au niveau de chaque hôpital. Si les décideurs estiment une telle information nécessaire, ils doivent être conscients que la mise au point d'une méthodologie et la mise en œuvre d'une recherche aussi délicate demanderont de sérieux efforts.

Pour une analyse plus approfondie de l'accessibilité des soins de santé en Belgique, les données de facturation qui sont disponibles dans les mutualités devraient pouvoir être couplées à de meilleures informations socio économiques sur les individus analysés. Pour construire une politique mieux différenciée, il faudrait aussi ajouter à ces données des informations sur la morbidité. La poursuite d'un travail sérieux sur ce thème demandera un couplage entre les données de l'AIM et les données fiscales. Une démarche en ce sens est en cours au KCE dans le cadre du projet MàF, en collaboration avec tous les partenaires concernés.

Scientific summary

Table of contents

1 INTRODUCTION ... 3

1.1 A BRIEF DESCRIPTION OF THE BELGIAN HEALTH INSURANCE SYSTEM ... 4
1.1.1 Coverage ... 4
1.1.2 Definition of supplements ... 5
1.1.3 Financial access for specific target groups ... 6

1.2 BACKGROUND OF THE REPORT AND POLICY CONTEXT ... 9

1.3 RESEARCH QUESTIONS ... 12

1.4 RESEARCH METHODS ... 12

1.5 PREVIOUS STUDIES FOR BELGIUM ... 14

1.6 IMPACT OF OOP PAYMENTS: SUMMARY OF LITERATURE REVIEW ... 15

1.7 REGULATION OF SUPPLEMENTS IN THE BELGIAN HEALTH CARE SYSTEM ... 15
1.7.1 Fee supplements ... 15
1.7.2 Material supplements ... 17
1.7.3 Room supplements ... 19
1.7.4 Other supplements ... 20

2 AN EMPIRICAL ANALYSIS OF THE DETERMINANTS AND DISTRIBUTION OF SUPPLEMENTS IN BELGIUM (2003) ... 22

2.1 INTRODUCTION ... 22

2.2 WHO PAYS SUPPLEMENTS? OUT-OF-POCKET PAYMENTS IN THE POPULATION ... 23
2.2.1 The distribution of supplements in the population (figures 2 and 3, tables 4, 5 and 6) ... 23
2.2.2 Which groups are mainly concerned (table 7)? ... 32
2.2.3 Which groups are "extreme" payers? ... 39

2.3 A DISAGGREGATED APPROACH ... 44
2.3.1 Disaggregated analysis at the level of the individual patient (tables 9, 10, 11 and 12) ... 44
2.3.2 Disaggregated analysis at the level of hospital stay (tables 13, 14, 15 and 16) ... 64

2.4 WHO RAISES SUPPLEMENTS? A FIRST LOOK AT REGIONAL AND SUPPLY-SIDE EFFECTS ... 71
2.4.1 Regional and supply-side effects for ambulatory supplements (tables 17 and 18) ... 72
2.4.2 Regional and supply-side effects for hospital supplements (tables 19a and 19b) ... 76

2.5 SUPPLEMENTS IN HOSPITALS: A DEEPER ANALYSIS ... 86
2.5.1 Who ends up in which room in which hospital? (table 20) ... 86
2.5.2 Wrapping up: the structure of supplements ... 92

2.6 THE POSITION OF SPECIFIC SOCIAL GROUPS ... 95
2.6.1 The effects of the system of preferential treatment ... 95
2.6.2 Supplements and the chronically ill (tables 21, 22, 23 and 24) ... 96
2.6.3 The position of the self-employed (tables 25, 26, 27 and 28) ... 102

3 SUPPLEMENTAL HOSPITAL INSURANCE AND OUT-OF-POCKET PAYMENTS ... 107

3.1 INTRODUCTION ... 107

3.2 SOME RELEVANT INSIGHTS FROM THE LITERATURE ... 107

3.3 WHO BUYS SUPPLEMENTAL HOSPITAL INSURANCE? ANALYSIS BASED ON HEALTH INTERVIEW SURVEY 2001 ... 108
3.3.1 The dependent variable: supplemental hospital insurance ... 109
3.3.2 What determines supplemental hospital insurance take-up? ... 109

3.4 COMBINING THE DATA FROM HIS 2001 AND IMA 112
3.4.1 Dependent and independent variables 112
3.4.2 The determinants of supplemental hospital insurance 112
3.5 SUPPLEMENTAL HOSPITAL INSURANCE AND OOP PAYMENTS: A FIRST APPROXIMATION 114
3.6 CONCLUSION 119
4 GENERAL CONCLUSIONS AND DISCUSSION 121
5 REFERENCES 125
6 APPENDICES 127

1 INTRODUCTION

The Belgian compulsory health care system is mainly financed through social security contributions and taxes. However, as in many developed countries with a public health insurance system, patients contribute to the costs of health care at the point of use. In Belgium these out-of-pocket (OOP) payments do not only include co-payments[a], but also supplements which are mostly paid on top of the co-payments.

During the last decade a large number of measures have been taken to guarantee or improve the financial accessibility of health care, especially for some vulnerable groups. These measures were largely meant to free low income and/or high cost persons from paying increasing co-payments. The increase of the supplements however was put only recently on the political agenda.

In the debate about supplements one can take two different perspectives. First, some players in the health care field justify the increase of supplements as a way to compensate for a structural under-financing of hospital services. Our analysis, however, focuses on the second perspective, namely on the distribution of supplements in the population with special attention to some weaker social groups, on the geographical variation and on the variation among hospitals.

Our analysis is related to research on financial accessibility of health care since supplements impact health care affordability. Because our dataset - a large administrative database made available by IMA (Intermutualistisch Agentschap- Agence Intermutualiste - Intermutualistic Agency)[b]- does not contain information on individual or household income, it is difficult for us to derive conclusions about the social consequences of a large financial burden as a result of getting ill. Moreover, other dimensions of accessibility were not examined either, e.g. if the choice of a single room, or the choice of some "more expensive" specialist would lead to better quality of health care. One possible approach to get a better understanding of the nature of this problem (is there a differential treatment of different social groups? is this differential treatment linked to the paying of supplements?) would be the organization of a survey. The dataset does not contain any direct information on health status either. We will therefore be unable to draw any conclusions about the possible effects of the supplements on the health situation of the patients. To do so would in any case have been dangerous with this kind of cross-section data. A convincing analysis of health effects should follow the evolution of health over time of specific groups of patients and compare this evolution with the one of a control group. An analysis of quality differences and health effects, however, was far beyond the frame of reference for this project.

We will therefore limit ourselves to a thorough investigation of the distribution of supplements over the population, including the potential differences in provider and hospital behaviour. In any case, such a study is a necessary first step for any serious study of the problems of financial access to the health care sector.

It is difficult to isolate the effect of the supplements in an evaluation of the financial accessibility of the health care sector. What matters from a social point of view are the total out-of-pocket payments of patients, i.e. the sum of co-payments and supplements. Therefore, while we of course focus mainly on supplements, we also regularly include co-payments in our analysis. This induced us to make some assumptions about the effects of the maximum billing (maximumfactuur- maximum à facturer).

The next section of this introductory chapter outlines the general characteristics of the Belgian health insurance system. Sections 2 and 3 describe the motivation for carrying out the study and specify the research questions, respectively. Section 4 introduces the overall research methods of the study. Section 5 compares our setup with some previous studies of supplements in Belgium. Section 6 summarises the results of a

[a] We use the term "co-payments" to refer to co-payments and co-insurance. Both are cost-sharing arrangements which require the individual covered to pay part of the cost of care. A co-payment is a fixed fee (flat rate) per item or service; in case of co-insurance the patient pays a fixed proportion of the total cost.

[b] IMA is a non-profit institution with all Belgian sickness funds as its members.

literature review on the impact of out-of-pocket payments on health care utilisation and expenditures and on their distributional consequences. The chapter concludes with a section about the regulation of supplements.

Chapter 2 is the main part of the report and contains a detailed analysis of the distribution of out-of-pocket payments and/or supplements in the population in general and with special attention to high or extreme payers, to the geographical variation and to the variation among hospitals.

Since the financial burden of being ill can be mitigated substantially in case of a supplemental hospital insurance coverage, some of the analyses of chapter 2 are redone to take account of the effect of having a supplemental hospital insurance. Chapter 3 reports the methodology that was used and the results.

Chapter 4 concludes the findings of the report.

1.1 A BRIEF DESCRIPTION OF THE BELGIAN HEALTH INSURANCE SYSTEM

Belgium has a compulsory health insurance system, covering the entire population and a wide range of services. Payments are predominantly fee-for-service with out-of-pocket payments. Out-of-pocket payments are paid by the patient as co-payments for ambulatory and inpatient care and as supplements. They are relatively large but some patients enjoy special protection. In this section, we will briefly summarise our health care system as far as it relates to (financial) access. The regulation with respect to supplements is described in detail in section 1.7.

1.1.1 Coverage[c]

The RIZIV/INAMI (National Institute for Sickness and Invalidity Insurance) is the federal government institution within the social security system that manages health insurance (medical care as well as invalidity allowances). The health insurance scheme for medical care in principle covers, on a compulsory basis, the entire population: employees, self-employed, civil servants, unemployed, pensioners, minimum income recipients, disabled, students, foreign nationals, as well as all of their dependents. Uninsured[d] can still exist, if beneficiaries do not fulfil the administrative and/or financial requirements (as e.g. asylum seekers), but their number is limited.

The coverage within the scheme of the self-employed (for active self-employed, pensioned self-employed, … and their dependents) is more restricted than that of the general scheme (the scheme of the other insured). The latter scheme covers 'major risks' (mainly hospitalisation costs) and `minor risks' (doctor's visits, physiotherapy, medicines, ...) whereas compulsory coverage for self-employed is only for major risks. Recently however an agreement has been reached to extend the coverage of the self-employed to that of the general scheme. As from July 1, 2006 self-employed starting a business and low-income pensioned self-employed are integrated in the compulsory insurance system for major and minor risks. The deadline for harmonization of the general regime and the scheme of the other self-employed is fixed at January 1, 2008.

The health insurance system does not provide medical services but reimburses consumption. All medical or paramedical interventions that can be reimbursed by RIZIV/INAMI are described in a list, the nomenclature, which is determined by Royal Decree and updated regularly. This list gives a detailed description of the intervention, the convention tariff and the conditions for reimbursement. The type of reimbursable benefits and their amounts (total fee and reimbursement) are determined through a complex process of negotiations with the various actors involved (insurers,

[c] This section is based on (Schokkaert et al., 2005)[1] and (European Observatory on Health Care Systems, 2000)[2].
[d] We define an uninsured person as someone who is not affiliated with a sickness fund and hence is not entitled to compulsory health insurance. This does not mean that "uninsured people" have no right to necessary medical care. They are covered by the public municipal welfare centres (OCMW/CPAS). There are different regulations: sometimes the welfare centres pay directly for the health costs of the uninsured, or they meet the cost of affiliating low-income families to a sickness fund [2]. These persons are not included in our analyses.

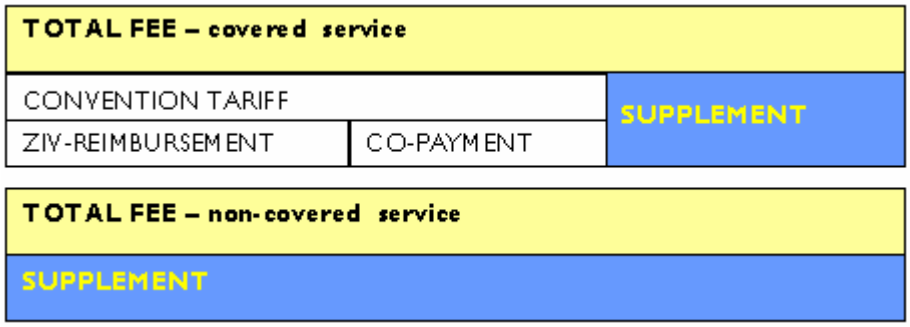
representatives of health care professionals, ...) within RIZIV/INAMI, all within preset budgetary limits. We call the negotiated fee the "convention tariff".

The practical organisation of the reimbursement is through one public fund and five private, non-profit sickness funds[e]. For ambulatory care, patients usually first pay the complete bill to the provider. Afterwards they are reimbursed partially by their sickness fund on submission of the bill. Hospital care and medicines are covered by a third-party payer system. The providers (hospitals and pharmacists) are directly paid by the sickness fund, whereas the patient only pays the OOP costs.

1.1.2 Definition of supplements

In general, reimbursement does not cover the full cost of the service. The out-of-pocket payments for the individuals consist of two parts. The difference between the convention tariff and the reimbursement by RIZIV/INAMI is the co-payment[f]. This is an official tariff. In addition, in some circumstances, more than this official tariff is charged by health care providers. Throughout our analysis we will define supplements as the difference between the total payments and the convention tariff[g] (see Figure 1). In some cases services are not covered by the compulsory health insurance. There is no convention tariff and the patients pay the full price out-of-pocket. This is the case for some medical services such as non-covered implants, drugs category D, para-pharmaceutical items, non-covered esthetical surgery and also for diverse non medical items for inpatients such as costs of a refrigerator, telephone or television in the hospital room. In our analyses, these OOP payments will also be considered as supplements (see figure 1). Although these payments are not supplements in the strict sense -the payments do not come on top of a convention tariff but the only payment is a 'supplement'- they can be interpreted as such in a broader perspective. From the patient point of view, all these own payments can endanger financial access. This means we also define the extra payments of patients due to a change in reimbursement legislation as supplements. Supplements can be charged for ambulatory care and for inpatient care. For inpatient care one usually makes the distinction between fee supplements, room supplements and material supplements. In addition there are payments for medicines, parapharmaceutical products and diverse items, for which no reimbursements exist since they are not included in the nomenclature.

Figure 1: Definition of supplements



[e] And a sickness fund exclusively for railway personnel and their dependents.
[f] 'Remgeld' in Dutch, 'ticket modérateur' in French. In some cases providers will ask a lower tariff than the official one or will not raise the co-payment. If this is the case, we define the co-payment as the difference between the fee paid and the reimbursement.
[g] This is similar to the system of balance billing for Medicare patients in the US.

1.1.3 Financial access for specific target groups

Especially in the ambulatory setting, co-payments can be large. Special measures have been taken to guarantee better (financial) access to health care services for some target groups[h]: the system of preferential treatment, the maximum billing, and lump sums for the chronically ill.

Preferential treatment

First, there is the system of *preferential treatment* (verhoogde tegemoetkoming – intervention majorée). Patients with preferential treatment pay reduced co-payments. The reduction depends on the type of expenditure (GP, specialist, drugs, hospital…). In brief, the co-payment for preferential treatment beneficiaries amounts to about 10% for consultations with a GP, 15% for consultations with a specialist, and more than 20% for physiotherapy, speech therapy, podology and dietetics. The percentages for patients without preferential treatment are 25% for consultations with a GP, 35% for home visits of a GP and 40% for consultations with a specialist, physiotherapy, speech therapy, podology and dietetics. The co-payments for drugs in an ambulatory setting are given in table 1[i]. The basis for reimbursement is classification within categories fixed by Royal Decree. The classification reflects the social importance of the drug, pharmacotherapeutic criteria and price criteria.

Table 1: Co-payments for outpatient drugs

Reimbursement category	Preferential treatment	Non preferential treatment
Category A	100% reimbursement No co-payment	100% reimbursement No co-payment
Category B	85% reimbursement Co-payment: 15% with a maximum of €7,00	75% reimbursement Co-payment: 25% with a maximum of €10,40
Category B Large package size	85% reimbursement Co-payment: 15% with a maximum of €10,40	75% reimbursement Co-payment: 25% with a maximum of €15,70
*Category B ATC 4th level	85% reimbursement Co-payment: 15% with a maximum of €10,40	75% reimbursement Co-payment: 25% with a maximum of €15,70
*Category B Large package size and ATC 4th level	85% reimbursement Co-payment: 15% with a maximum of €15,70	75% reimbursement Co-payment: 25% with a maximum of €23,50
Category C	50% reimbursement Co-payment: 50% with a maximum of €10,40	50% reimbursement Co-payment: 50% with a maximum of €17,40
*Category C ATC 4th level	50% reimbursement Co-payment: 50% with a maximum of €15,70	50% reimbursement Co-payment: 50% with a maximum of €26,10
Category Cs	40% reimbursement Co-payment: 60% without maximum	40% reimbursement Co-payment: 60% without maximum
Category Cx	20% reimbursement Co-payment: 80% without maximum	20% reimbursement Co-payment: 80% without maximum

Source: RIZIV[3]

[h] We only mention those measures relating to co-payments that are relevant for the empirical part of the study. Hence we neglect measures as the special solidarity fund (bijzonder solidariteitsfonds, fonds spécial de solidarité) or the third-party payer system and regional measures such as the Flemish long-term care insurance. The regulation of supplements is summarised in section 1.7.

[i] The categories marked with a * were introduced on November 1, 2005 where a generic alternative exists for branded drugs.

In 1997, the number of people qualifying for preferential treatment increased with about 20% because new socio-economic vulnerable groups were added. A low income level is the common characteristic of the target groups in order to qualify for preferential treatment. The following[j] persons and their dependents are eligible for preferential treatment[k], provided the gross taxable income of the family does not exceed a yearly adapted limit[l]:

- Pensioners
- Widowers/widows
- Orphans
- Invalids (receiving a disablement benefit)
- (Controlled) long term unemployed, aged 50 and older with at least one year of full unemployment (according to the definition of the employment regulations)
- Civil servants who are laid off because of illness or infirmity for at least one year
- Residents[m] aged 65 and older
- Members of a convent community aged 65 and older
- Handicapped children entitled to increased child allowance
- Persons entitled to one of the following allowances:
    - Integration allowance for handicapped persons
    - Income replacement allowance for handicapped persons
    - Income guarantee for the elderly (gewaarborgd inkomen voor bejaarden of inkomensgarantie voor ouderen – revenu garanti aux personnes âgées ou la garantie de revenus pour personnes âgées)
    - Disability benefit
    - Subsistence level income (leefloon in Dutch – minimum vital in French)
    - Support from the public municipal welfare centres (OCMW in Dutch, CPAS in French)
    - Allowance for assistance for the elderly

Maximum billing

Second there is the system of *maximum billing (MaB), which gradually replaced the system of social and tax exemptions.* The purpose of the MaB is to limit the total amount of co-payments. There is a danger that in case of a long-term or serious illness the total amount of co-payments can become very large and would constitute a sizeable share of the household budget. The MaB is a remedy to this problem by guaranteeing to patients that their annual co-payments will not exceed a certain limit, which varies with family income. The protection is not complete, since not all co-payments are taken into

[j] Since the majority of the analyses were performed on data of 2003, throughout this section we describe the situation for the year 2003. In case of relevant changes between 2003 and 2006, we also mention the current situation.

[k] Article 37, $$ 1 and 19 of the Law regarding compulsory insurance for health care and indemnities, coordinated on July 14, 1994.

[l] In 2003 the income limit equalled €12,482.92 (01/01/2003-31/05/2003) or €12,732.29 (01/06/2003-31/12/2003) with an additional amount per dependent (€2,310.92 for the first semester or €2,357.09 for the second semester).

[m] "Residents" are a specific category of inhabitants registered in the so-called waiting registry (wachtregister–registre d'attente) or registry for foreigners (vreemdelingenregister-registre des étrangers)[4].

account (but there has been a gradual extension). The protection is in principle at the level of the household (those family members living together according to the National Register of physical persons on January 1 of each year).

There are four types of maximum billing.

- Social maximum billing: A threshold of €450 is applied at the household level for specific vulnerable groups. It is applicable to households, with at least one individual with preferential treatment or who is entitled to an allowance for handicapped persons[n]. There is no specific link to income, since these vulnerable groups per definition have a small income. As soon as the limit of €450 has been reached, the co-payments are waived for the rest of the year.
- Maximum billing children (individual entitlement): A threshold of €650 is applied at the level of the child. All children younger than 16 years (19 years from 1/1/2004) with total co-payments of €650 become individually entitled without taking into account family income.
- Maximum billing for low and modest incomes: A threshold of €450 for low incomes and €650 for modest incomes is applied at the household level. In 2003 the income threshold to qualify for low income equalled €13,956.17 and €21,455.00 for modest income.

These three types of maximum billing are administered by the mutualities, and the execution is therefore immediate.

- Fiscal maximum billing: applies to all fiscal households with an income higher than the limit for maximum billing for modest incomes. When these households have co-payments exceeding the threshold taking into account their net year income, they are eligible for fiscal maximum billing. For this group, knowledge of fiscal income is necessary, and therefore the tax administration carries out the repayments (when taxes are levied, about 2 years after date). The system of fiscal maximum billing was abolished in 2005. Since then the principle of maximum billing for low and modest incomes is applied, in a gradual way, to all incomes.

Lump sum subsidies

In order to compensate people who can be expected to have high medical expenditures, some *lump sum subsidies* have been installed: lump sum for people with a chronic illness, lump sum for palliative treatment at home and lump sum for incontinence material[5].

- Lump sum for the chronically ill: to compensate for extra expenses accompanied by a chronic illness. The annual lump sum amounted to €247.89 in 2003 and €253.61 in 2006. The Royal Decree of June 2, 1998 defines the standards a chronically ill patient has to meet in order be entitled to the lump sum[o]. Two conditions have to be fulfilled at the same time. First, the amount of co-payments exceeds a threshold during two consecutive years[p]. On January 1, 2003 this threshold was equal to €323 for an individual and €450 for a family[q]. Since January 1, 2006 solely the co-payments of the chronically ill are taken into account, with a threshold of €365 for beneficiaries of preferential treatment[r] and of €450 for the other insured. A second condition concerns

[n] Since January 1, 2006 the definition of household has changed: only the co-payments of the individual entitled to preferential treatment, his or her partner and dependents are taken into account.
[o] See the Technical note in appendix 1 for more details.
[p] The calculation method of the co-payments is the same as the one which applies to the maximum billing.
[q] Beneficiary plus dependents.
[r] It suffices that an insured is entitled to preferential treatment for only one day to benefit from the threshold. If an insured is entitled to preferential treatment in one year but not in the other, she has to meet two different thresholds.

the degree of dependency during the current calendar year. The chronically ill has to be in one of the following situations:

- Entitled to lump sum B or C for home care as determined according to Katz scale[s], during at least three months, approved by the advisory doctor of the sickness fund
- Entitled to at least six months of physiotherapy, approved by the advisory doctor of the sickness fund (previously known as "category E")
- Entitled to an invalidity allowance for a person considered as with a person at charge because of his need for assistance
- Entitled to an integration allowance for handicapped persons or to an assistance allowance for handicapped persons
- Entitled to an allowance for assistance for the elderly;
- Entitled to preferential treatment because of need for assistance
- Being admitted in a hospital for at least 120 days or at least 6 times during the current and previous calendar year
- Entitled to increased child allowance

Overall, the number of chronically ill entitled to this lump sum increased from 26,420 in 1998 to 206,464 in 2005 [6].

- Lump sum for incontinence material: the Royal Decree of June 2, 1998 defines the conditions to be entitled to this lump sum. First, a patient needs the approval of the advisory doctor of the sickness fund for the lump sum B or C for home care, as determined according to Katz scale, to be reimbursed for at least four months out of the last twelve months. Secondly, a score of three or four on the Katz scale has to be related to the functional impairment because of incontinence. The legislator imposed an additional condition: in order to be entitled to the lump sum for incontinence material, the patient should not stay in a nursing home on the last day of the period of four months. The lump sum for incontinence material was equal to €371.84 in 2003 and €416.72 on January 1, 2006. The lump sum payment can be allowed only once a year. The number of entitled beneficiaries increased from 20,601 in 1998 to 35,535 in 2005 [6].

- Lump sum for palliative treatment at home: introduced by the Royal Decree of December 2, 1999. Since January 1, 2000 palliative patients[t] at home are paid a lump sum to cover expenses for medicines, devices and care material. This lump sum can be allowed twice. The lump sum is an amount per month and equals €483.39[u].

1.2 BACKGROUND OF THE REPORT AND POLICY CONTEXT

'Hospital stays get more and too expensive' is a complaint by patients and sickness funds which is increasingly heard over the last years. On the other hand, the hospital sector justifies the extra charges placed on the patient's shoulders by the need to compensate for the continued underfinancing of hospital services.

Some recent studies performed by the Christian and Socialist Mutualities [7-9] suggest that (some) Belgian hospitals indeed charge large and increasing supplements.

We only give the results of (Di Zinno, 2006)[9] but they are very much in line with those from (Di Zinno, 2005)[8] and the Christian Mutualities. The study compares the health costs for the years 2002 and 2004[v] for all inpatient hospitalisations of the members of

[s] The Katz scale is a six- item scale of basic activities of daily living: eating, dressing, bathing, toileting, transferring, incontinence of bowel and/or bladder.
[t] See art 3 of the Royal Decree of December 2, 1999 for the conditions to qualify for a palliative patient.
[u] There is no indexation.
[v] Some tables compare the year 2000 with 2004.

the Socialist Mutualities in a general hospital. The dataset contains detailed information on the reimbursements by RIZIV/INAMI, co-payments and supplements[w].

Table 2 shows the absolute amounts and cumulated growth for different subcategories of supplements and co-payments per hospital stay in 2002 and 2004. From 2002 to 2004 total out-of-pocket payments for an inpatient stay increased on average from €354 to €402, which amounts to a cumulated increase of 14 percent. This increase was almost entirely due to increasing supplements. The cumulated increase of supplements over the same period was 21 percent, whereas total co-payments per hospital stay rose by only 3 percent. Especially the increase of medical fee supplements and material supplements is striking. Diverse supplements and room supplements increased at a lower rate.

We should confront these results with the fact that during the same period several measures have been put in place to regulate the amount of supplements for a hospital stay[x]. By the Royal Decree of September 29, 2002 implementing article 138 of the Hospital Law, coordinated on August 7, 1987, some categories of patients were guaranteed the official tariff in case of a two-person or common room: beneficiaries of preferential treatment, people eligible for the lump sum for the chronically ill, the lump sum for incontinence material and the lump sum for palliative treatment at home and persons admitted to an Sp-service for palliative care. This new article 138 of the Hospital Law, which came into force on December 1, 2002, therefore protects some patients against fee supplements, but the same is not true for the material supplements.

Table 2 clearly shows that the increase of supplements is uniform neither over the different types of supplements nor over the two categories of beneficiaries, protected and non-protected[y].

In addition to these studies, the Christian, Socialist and Independent Mutualities provide additional information on hospital supplements on their website. There are some limitations, but in general they give access to detailed information on the different types of (maximum) supplements, by room type and by service or intervention, charged in every Belgian hospital. In this way patients have the possibility to compare costs between hospitals before their admission.

[w] For more detailed information on the definition of co-payments and supplements, we refer to the original study.

[x] In section 1.7 we give a detailed overview of the regulation of supplements. Here we only mention some measures to illustrate their effect on the subcategories of supplements for beneficiaries protected or not by Law.

[y] Only the beneficiaries of preferential treatment were included in the protected group.

Table 2: Evolution of supplements and co-payments per hospital stay for protected and non-protected beneficiaries, 2002-2004 (in €)

	Total population			Protected			Non-protected		
Type of supplement	2002	2004	Cumulated growth	2002	2004	Cumulated growth	2002	2004	Cumulated growth
Fee supplements	74,9	95,2	27,1%	25,9	26,3	1,5%	93,6	121,5	29,8%
Material supplements	29,4	50	70,1%	30,3	46,1	52,1%	29,1	51,5	77,0%
Room supplements	52,7	55	4,4%	38,8	39,5	1,8%	58	60,9	5,0%
Medicine supplements	34,9	34,3	-1,7%	39,6	39,3	-0,8%	33,1	32,4	-2,1%
Diverse supplements	22,9	24,6	7,4%	21	23,4	11,4%	23,6	25	5,9%
Total supplements	214,8	259,1	20,6%	155,6	174,6	12,2%	237,4	291,3	22,7%
Type of co-payment									
Co-payment on fees	43,7	48,3	10,5%	13,9	13,3	-4,3%	55,1	61,7	12,0%
Co-payment on patient-day	89,7	89,7	0,0%	53,9	53,6	-0,6%	103,3	103,5	0,2%
Co-payment on medicines	5,5	5,3	-3,6%	7,6	7,3	-3,9%	4,7	4,5	-4,3%
Total co-payments	138,9	143,3	3,2%	75,4	74,2	-1,6%	163,1	169,7	4,0%
Total OOP payments	354	402	13,8%	231	249	7,7%	401	461	15,1%

Source: (Di Zinno, 2006)[9]

1.3 RESEARCH QUESTIONS

The overall objective of this report is to evaluate the magnitude and distribution of supplements in the population, the variation among hospitals and the geographical variation. We translated this broad research question into the following specific questions:

What is the magnitude of total supplements paid by the population? Since financial access to health care does not only depend on supplements but also on co-payments, we also investigate the total amounts and joint distribution of supplements and co-payments under different scenarios, depending on the assumptions we make about the effects of the system of maximum billing.

How are supplements distributed in the population, with special attention to demographic, socio-economic and morbidity characteristics? In general, we can assume that a higher morbidity increases the likelihood of incurring higher supplements (and co-payments). We examine the relationship between supplements and individual characteristics which may determine morbidity.

Which groups are high/extreme payers? From a policy point of view it may be more interesting to focus at the high-expenditure tail of the distribution of supplements. Because of the lack of income data we specify thresholds for supplements and OOP payments to describe high and extreme payers.

What is the relative importance of different subcategories of supplements? We disaggregate the total amount of supplements in subcategories and analyse the distribution of these subcategories over the population. A first level of disaggregation is a breakdown between hospital and ambulatory supplements. The second level is the division of hospital and ambulatory supplements mainly according to medical discipline (GP, specialists, surgery, physiotherapy, dental care, medical imaging, clinical biology, implants, …).

What is the relative importance of demographic, socio-economic and morbidity characteristics on the one hand and regional and supply side "price-setting" behaviour on the other hand in the magnitude and distribution of supplements? The amount of supplements does not only vary with morbidity, but may be influenced by price setting behaviour of doctors or hospitals or by regional practice variations. To disentangle the different effects, we propose an approximation of unit prices for the different subcategories of supplements and co-payments.

Who has a supplemental hospital insurance and what is its effect on the total amount of OOP? Depending on the policy, a supplemental hospital insurance can reduce the OOP payments which have to be paid substantially. Since our dataset contains no information on supplemental hospital insurance, we will only be able to offer a first approximation of the effects of supplemental hospital insurance.

1.4 RESEARCH METHODS

To try to answer the above-mentioned research questions, we used a large administrative dataset at the level of the individual, household and hospital stay for the years 2002 and 2003. The dataset is a random sample of about 300,000 individuals. Each individual had a chance of 1/40 of being included in the sample, except for the elderly (65 and older) who had a chance of 1/20.

We give a detailed description of all variables and data manipulations in the Technical Note in appendix 1. The sample contains an extensive set of demographic and socio-economic personal characteristics and detailed information on health care expenditures at the level of the individual or household and at the level of a hospital stay. Health care expenditures consist of reimbursements of the RIZIV/INAMI, co-payments and supplements and are aggregated in about 250 categories. This aggregation meets the following principles: distinction between ambulatory and inpatient expenditures, co-payments and/or supplements are applied or otherwise, co-payments are included in the MaB or otherwise, detailed codes give an indication about morbidity.

The information in the administrative dataset was combined with information at the level of the hospital such as size, district and public/private status. This information was made available by the Federal Public Service – Health, Food chain safety and Environment[z].

The database is the only database available in Belgium with such general and extensive information on patients' own payments. However, an analysis of out-of-pocket payments in general and supplements in particular solely on the basis of administrative data has some weaknesses compared to other methods of data collection, such as a survey. The IMA-dataset in particular has some specific disadvantages. Only data related to the legal mandate of the sickness funds in the context of the compulsory Sickness and Invalidity Insurance system can be made available by IMA. Therefore some important information is missing.

An important gap in the IMA-data is the lack of information on some categories of OOP payments. One important category not included are non-prescription or OTC (over-the-counter) medicines. Since these expenditures are not registered, the exact amount of OOP payments for OTC medicines can only be obtained by a survey (like the Belgian Health Interview Survey). Other categories which are not (or only partially) included in the data are items which are not taken up in the nomenclature, such as homeopathy, orthodontics for adults, acupuncture and more care-related expenditures in nursing homes and homes for the elderly.

Another important lacuna of the IMA-dataset relates to the self-employed without rights for their minor risks in the compulsory system. Since we do not have any information on their expenditures for minor risks, we crucially underestimate their OOP payments. Moreover, including the self-employed in the analysis could really bias some of our interpretations since the dependent variable (amount of reimbursements, supplements or co-payments) only refers to major risks for the self-employed, whereas for the general regime it refers to the major and minor risks. While in general we will interpret a 'lower' amount of supplements (or co-payments) as a 'smaller' threat to equality of access, this interpretation would be extremely misleading for the self-employed. We have therefore opted to leave them out of the general analysis. We will bring together some results about this group in section 2.6.3, however.

As mentioned before, the IMA-dataset offers detailed information on health expenditures. The data on the reimbursements by RIZIV/INAMI and on co-payments can be considered as exhaustive. The data on supplements however are much less reliable, especially the supplements raised in an ambulatory setting, because of their incompleteness. The supplements raised in a hospital setting are stated on the hospital's invoice. This document is made available to the patient, who has to pay the amount of co-payments and/or supplements, and to the sickness fund of the patient, who pays the part covered by the health insurance (third-party payer). Of course, there may be differential reporting behaviour between hospitals, e.g. for diverse costs, leading also to incomplete or not fully comparable data. For ambulatory supplements there is no regulation on the information a GP or medical specialist should provide. Therefore we should be rather cautious when interpreting and extrapolating the results for the ambulatory supplements.

Given these limitations of the data, we had to adapt an operational approximation to the definition of supplements (as given in section 1.1.2). Our workable definition of supplements is reduced to "the difference between the total payments and the convention tariff as far as the information is available in our dataset".

A crucial lacuna of the IMA-dataset has to do with the fact of having a supplemental hospital insurance or not[aa]. The dataset does not contain any information on supplemental hospital insurance. Moreover, in addition to the voluntary supplemental

[z] Centraal instellingenbestand in Dutch, fichier centralisé des institutions in French.

[aa] This lacuna is very common to most data sources in Belgium. The Health Interview Survey contains a question on supplemental hospital insurance (see chapter 3), though in a very incomplete way. Also the Health Care section in the SHARE survey includes questions about supplemental health insurance cover (www.share-project.org).

hospital insurance, most sickness funds oblige their members to subscribe to a supplemental insurance with limited coverage (e.g. part of paradontal care, eye-glasses…). This information is also missing. Consequently, for a large part of the population the total amount of OOP payments which really have to be paid will be substantially lower than the amount given in our data. In the largest part of the analysis we will however completely neglect this crucial factor, i.e. we will do as if everybody has to pay her OOP payments really out of her own pocket. In chapter 3 we will return to the problem of supplemental hospital insurance and analyse who has a supplemental hospital insurance in Belgium, based on information in the Health Interview Survey of 2001. We will then also link this preliminary analysis to some of the previous results. As mentioned before, the IMA-dataset is a panel for two successive years, 2002 and 2003. However, a two year-period is too short to derive reliable conclusions about changes over time. Therefore we performed most analyses solely with the year 2003. To have some idea about the persistence over time of paying (high) supplements and co-payments, we combined the data for 2002 with those of 2003.

The dataset does not contain information on income. However, we can more or less infer the socio-economic status of an individual from a large set of other variables: being economically active, unemployed, pensioned, beneficiary of subsistence income level, invalid… Throughout the analyses we stick rather closely to the administrative definition of these categories, as defined in the dataset. This choice has the significant disadvantage that we cannot draw conclusions for specific (weaker) socio-economic groups such as "the invalids" or "the unemployed". On the other hand, this method of using an administrative definition of socio-economic groups implies that policy measures can be directly focused on clearly definable groups.

As regards the method of analysis, we use different regression methods (OLS, logit, probit and multinomial logit) depending on the concrete question addressed. The explanation of and motivation for each particular method of analysis is provided in the separate sections of chapter two and three of this report[bb].

1.5 PREVIOUS STUDIES FOR BELGIUM

This project is closely related to the study of the UNMS[9]. The authors of the UNMS-study give a detailed picture of the out-of-pocket payments of a hospital stay in 2004, distinguishing between co-payments and supplements. Their analysis is based on exhaustive data of their own sickness fund. Our sample is broader, since it covers all sickness funds. We include ambulatory supplements in the analysis. Moreover, we will also analyse the data at the level of the individual and not only at the level of the hospital stay. Since individuals can have more than one stay during a year, this analysis at the individual level may give interesting additional information. Compared to (Di Zinno, 2006)[9] we also go further in trying to link the observed out-of-pocket payments to morbidity characteristics and to decisions by patients and providers. While the general picture emerging from both analyses is similar, our analysis therefore offers a richer perspective on the distribution of supplements over individuals and regions. On the other hand, [9] also sketches the evolution over time of the OOP payments of a hospital stay (see section 1.2), while we limit ourselves mainly to a deeper analysis of the data for one year (2003). They also exploit information on differences between individual hospitals in supplements related to some specific interventions (deliveries in single rooms, knee prosthesis). We will analyse differences between hospitals in more general terms and link these differences to hospital characteristics. All in all, our project and the UNMS-studies seem nicely complementary.

An older and more restricted study of the personal costs of a hospital stay has been executed by the Centrum voor Gezondheidseconomie en Ziekenhuisbeleid of the VUB[10]. Their study has the interesting feature that they work with data in which financial information on the costs is matched to diagnostic information of the patients, which gives them the opportunity to distinguish different pathologies. However, their data are taken from 30 hospitals only and refer to 1996. Since then the situation with

[bb] We did not include all estimation results (e.g. we also performed analyses at the level of districts instead of provinces). All results are available on request.

respect to supplements has considerably changed. Moreover, they focus on co-payments and, with respect to supplements, only material supplements and medicines are included in their definition of personal costs. Fee and room supplements are left out, because they consider these to reflect a free personal choice of the patient. Their results are therefore not directly comparable to this study. However, their finding that the personal costs (as they define them) may be very different for different pathologies is a most interesting one. Future work should try to introduce more information about specific pathologies in the analysis of the financial burden of the patients.

1.6 IMPACT OF OOP PAYMENTS: SUMMARY OF LITERATURE REVIEW

In a health insurance system with large and increasing out-of-pocket payments like Belgium, from time to time concerns are expressed about the possible impact of these OOP payments on health care utilisation or on health. Our dataset however did not allow us to answer any question about possible consequences of out-of-pocket payments on utilisation or health. As mentioned in section 1.4, we disposed only of data for two consecutive years, which is too short a period to analyse behavioural responses to price changes. Moreover, the dataset contains hardly any information on health.

Prior research however shows that we should at least be careful when drawing conclusions from our empirical results. We therefore have included a review of the literature on the impact of cost-sharing arrangements[cc]. In general our review finds that there is clearly an impact of cost-sharing on the health care utilisation (such as the probability of seeing a doctor or of having a hospital stay) but the magnitude of the impact varies greatly with the care component. The most elastic components of care are ambulatory/outpatient care and medicines, the less elastic relate to specialist visits and hospital treatment. Moreover, temporary diseases have a larger elasticity than chronic diseases. Although it is sometimes dangerous to extrapolate in an automatic way the results obtained in other countries with a different institutional structure, our review of the literature suggests that further research about this topic for Belgium would certainly be useful.

1.7 REGULATION OF SUPPLEMENTS IN THE BELGIAN HEALTH CARE SYSTEM

From the previous sections we learned that the Belgian government has already taken several measures to protect patients from excessive out-of-pocket payments. Most of the stated measures however only relate to co-payments. In this section we give a more detailed overview of the regulation of supplements.

1.7.1 Fee supplements

1.7.1.1 Physicians and dentists

The fee schedules for physicians and dentists are determined in so-called agreements (in Dutch 'akkoorden', in French 'accords') between representatives of the insurers and of the organisations of physicians and dentists (Law of 14/7/1994, art. 50). Physicians and dentists who accede to the agreements have to adhere to the fee schedule as determined in the nomenclature. The agreements also specify the conditions with respect to time, place, special requirements or economic situation of the beneficiaries where fee schedules can be exceeded. Decisions in the commission are taken by a double 75 percent majority; this means 75 percent of the members representing the insurers and 75 percent of the members representing the physicians or dentists. Without a double 75 percent majority, the commission votes again with respect to the same proposal within 15 days. This time, a decision can be taken by a double ordinary majority. The agreements are usually signed for a period of at least two years.

[cc] The literature review is included in Appendix 2.

Physicians and dentists have a choice whether or not to *join the agreement*. They can either do this *completely*; then the official fee schedule applies. They can also do this *partially*; this means they can set fees themselves during a pre-specified time during the week (this has to be announced to the patient). For inpatients (also surgical day hospital, day hospitalisation with lump sum A, B, C and D and maxi-lump-sum for chemotherapy[dd]) staying in a common room or a two-person room, physicians who joined the agreement (fully or partially) cannot charge fee supplements[ee]. But they can charge their patients fee supplements if they stay in a single room.

A third possibility is that the dentist or physician completely *rejects the convention.* In this case she can determine freely the amount of fee supplements[ff]. In practice, physicians who reject the convention can charge supplements, irrespective of the choice of room of the patient, but this has to be announced to the patients and a maximum has to be determined. In addition, they have to respect agreed tariffs in two-person or common rooms for specific vulnerable groups[gg], e.g.:

- Most beneficiaries of preferential treatment[hh] and their dependents;
- Patients eligible for the lump sum for chronic diseases;
- Patients eligible for the lump sum for incontinence material;
- Patients eligible for the lump sum for palliative treatment at home or admitted to a hospital service for palliative care (Sp-service);
- Persons entitled to a lump sum for handicapped (except integration allowance cat. 3 and 4 with reduction due to income).

From 2006 these categories are extended with children qualifying for increased child allowances[ii].

For patients staying in a single room, there is still a limitation on the fee supplements that can be charged. For physicians who joined the agreement fee supplements are not allowed

- when the medical condition of the patient, or the technical conditions for investigation, treatment or supervision necessitate a stay in a single room;
- when the necessities of the service or the unavailability of two-person or common rooms require a stay in a single room;
- when the patient is beyond his control admitted to an emergency unit or intensive care unit for the duration of the stay in such a unit.

For physicians who rejected the agreement, the rules applicable in a two-person or common room apply in the abovementioned cases.

In case there is no agreement, maximum fees can be determined by Royal Decree. Without a Royal Decree existing regulation continues to apply. In 2003, a convention was in place. A total of 15.91% of GPs refused the convention and 18.19% of specialists

[dd] Hospitals receive these lump sums for patients who don't spend the night at the hospital. The amount of the lump sum depends on the specific intervention. Some lump sums are the same for all hospitals, others vary with the hospital.

[ee] Royal Decree of September 29, 2002 implementing article 138 of the Hospital Law, coordinated on August 7, 1987 and into force since December 1, 2002.

[ff] Physicians or dentists who do not join the agreement have to announce this by registered mail. For an agreement to be valid at most 40% of the physicians or dentists can have refused the agreement and at most 50% of GPs or specialists per district (arrondissement).

[gg] Royal Decree of September 29, 2002 and of January 9, 2003 implementing article 138 of the Hospital Law, coordinated on August 7, 1987 and into force since December 1, 2002. Article 138 of the Hospital Law was modified by the Law concerning measures for health care of January 14, 2002.

[hh] Mainly pensioners, widowers/widows, orphans, invalids, long term unemployed, persons entitled to subsistence level income or allowance for assistance for the elderly.

[ii] Royal Decree of March 8, 2006.

(detailed figures per district in chapter 2, table 18). There are no data available on partial agreement.

1.7.1.2 Other health care providers

Conventions (in Dutch 'overeenkomsten, in French 'conventions') regulate financial and administrative relations between the insured and the insurance institutions on the one hand and health care providers other than physicians and dentists on the other hand (Law of 14/7/'94, art. 42-49).

Conventions with midwives, nurses, physiotherapists, speech therapists and providers of prostheses, appliances and implants determine fees and prices. A national convention can be completed by conventions at the level of a district[jj]. Convention committees within RIZIV/INAMI have an equal number of representatives of the insurers and of the health care providers/institutions. The abovementioned health care providers who joined the convention cannot charge supplements, not even for patients in a single room.

The convention with pharmacists determines the fees for magistral preparations and for delivery of branded drugs.

All of the abovementioned providers who rejected the convention are allowed to charge supplements to all patients except to beneficiaries of preferential treatment[kk].

In contrast to the situation for physicians and dentists, where an implied accession applies, other health care providers have to communicate explicitly accession. The King can specify maximum fees and prices when less than 60% of them adhere to the convention. In addition, he can reduce reimbursements with 25% for providers who do not join the convention and declare fees generally binding with respect to beneficiaries of preferential treatment.

All conventions are usually signed for a period of two years which can be prolonged tacitly.

1.7.2 Material supplements

The first national agreement between suppliers of implants and sickness funds dates from December 1996 (effective since August 1997). This national agreement substantially improved the protection of the patients. Implants can be found in three articles of the nomenclature: art. 28, art. 35 and art. 35bis. The regulation is rather complicated and specific to each type of implant or instrument. Still some rules are common for most articles. First, most implants or instruments qualifying for reimbursement are listed with a specified reimbursement rate. For the reimbursable implants not listed in the nomenclature the reimbursement rate is determined by the 'College van geneesheren-directeurs' (le Collège des médecins-directeurs), based on the individual bill. A second common characteristic is the delivery margin[ll]. This is a co-payment charged by the hospital pharmacist equal to 10 percent of the purchase price of the hospital with a maximum of €148.74. Common to all articles is further that some of the implants/instruments are reimbursed on a lump sum basis. This means that the reimbursement is fixed, irrespective of the number of implants or quantity of material used and irrespective of the real price of the implants and material. The delivery margin equals 10% of the lump sum. A lump sum reimbursement gives the greatest protection to the patient since no supplements can be charged. In other circumstances, supplements can be charged, but they can never exceed the difference between the purchase price to the hospital and the reimbursement. But sometimes further protection is given.

The regulations differ for the three articles, but the five categories in articles 35 and 35bis are treated in a similar way.

[jj] The definition of 'district' was never decreed. Until now only national conventions were negotiated.

[kk] This possibility was decreed neither.

[ll] Ministerial Decree of February 18, 1998.

Article 28 is the longest in place; it gives least protection to the patient and the legislator wants to move the implants and instruments from this article to art. 35 and art. 35 bis. Supplements can be charged, consisting of the difference between the purchase price of the device (taxes included) and the reimbursement. No (additional) upper limit is in place.

Article 35bis relates to so-called invasive medical devices, mostly endoscopic or viscerosynthesis material. The invasive medical devices are subdivided in five categories (1a, 1b, 2a, 2b, 3).

- Category 1a: endoscopic and/or viscerosynthesis material
- Category 1b: endoscopic and/or viscerosynthesis material with limited reimbursement
- Category 2a: other invasive medical devices
- Category 2b: other invasive medical devices with limited reimbursement
- Category 3: invasive medical devices with limited clinical use (under evaluation or specific application)

Most of the invasive medical devices of categories 1a, 1b, 2a and 2b (listed) are reimbursed on a lump sum basis. As mentioned before, no additional supplements can be charged to the patient in this case. Other items are reimbursed on a per unit basis. For these items a reimbursement per unit is listed. In contrast to article 28, a percentage of the reimbursement can be specified as 'safety margin'; devices for which the purchase price of the hospital (taxes included) exceeds the reimbursement level with more than this safety margin, are excluded from reimbursement. The safety margins are specified per type of instruments. The difference between sales price and reimbursement can be charged to the patient as a supplement. Category 3 consists of instruments under evaluation. Currently there is no reimbursement of category 3.

Article 35 of the nomenclature relates to implants[mm].

There are 5 categories of implants:

- Category 1: Active implants (pacemakers, programmable implanted pain-pump and neurostimulator and cochlear implants)
- Category 2: Implants with high risk
- Category 3: Implants with relatively high or low risk
- Category 4: Custom-made implants
- Category 5: Implants with limited clinical use (under evaluation or specific application)

There is a limited list of implants category 1. Producers on the list have agreed to respect the reimbursement price. As a consequence, patients do not have to pay supplements. For implants of category 2 and 3, a safety margin (as a % of the reimbursement) is specified. Products only qualify for reimbursement if their selling price to the hospital (taxes included) is below the reimbursement plus the safety margin. Supplements for the patients are thus limited to this safety margin. In case of lump sum reimbursement, there are no supplements for implants of category 2 and 3.

Reimbursement of implants of category 4 is determined on an individual basis by the 'college van geneesheren directeurs'. These implants if produced by a foreign firm can also qualify for reimbursement if the selling price of the Belgian importer does not exceed 150% of the price billed by the foreign firm. Also implants of category 5 are evaluated on an individual basis by the 'technische raad voor implantaten' (conseil technique des implants in French). In practice there are no supplements for implants of category 5: or they are reimbursed on a lump sum basis, or there is a limited list of

[mm] In contrast to invasive instruments, implants remain in the human body (for at least 30 days).

implants of category 5. As is the case for category 1, producers on the list have agreed to respect the reimbursement price.

1.7.3 Room supplements

Article 90 of the Hospital Law specifies that room supplements can be charged in case of inpatient and day hospitalisations in a single or two-person room. Room supplements can be charged only if the hospital has at least 50 percent of its beds available for treatment without supplements. Also for children accompanied by a parent, a sufficient number of beds for treatment without supplements need to be available. The supplement in a two-person room is limited; the maximum amount was set at €18.95 on February 1, 2002, and is linked to the consumer price index. Since August 1, 2005 the maximum supplement equals €20.11. In a single room there is no legally determined upper limit[nn].

The law further specifies circumstances where no supplement can be charged.

For patients staying in *a single room* (including day hospitalisation as defined by Royal Decree), no supplements can be charged:

- when the medical condition of the patient, or the technical conditions for investigation, treatment or supervision necessitate a stay in a single room;
- when the necessities of the service or the unavailability of two-person or common rooms require a stay in a single room;
- when the patient is beyond his control admitted to an emergency unit or intensive care unit for the duration of the stay in such a unit.

For patients in *a two-person room* no supplements can be charged if the last two circumstances apply. Similar to the regulation of fee supplements, room supplements in a two-person room cannot be charged to the following beneficiaries since July 1, 2006[oo]:

- Most beneficiaries of preferential treatment and their dependents;
- Patients eligible for the lump sum for chronic diseases;
- Patients eligible for the lump sum for incontinence material;
- Patients eligible for the lump sum for palliative treatment at home or admitted to a hospital service for palliative care (Sp-service);
- Persons entitled to a lump sum for handicapped (except integration allowance cat. 3 and 4 with reduction due to income);
- Children qualifying for increased child allowances.

Conventions with respect to nursing facilities contain a commitment to adopt the specified nursing day price. Deviations are possible if the patient requires a single room without it being necessary for his state of health or treatment.

Conventions with certified services and institutions with application of hospital legislation, legislation of resting homes for elderly, sheltered living and temporary crisis centres, specify the conditions for application of compensation of admitted patients in these institutions.

[nn] The Royal Decree of September 29, 2002 implementing article 90 of the Hospital Law, coordinated on August 7, 1987 and into force since December 1, 2002 only fixes the maximum supplement in a two-person room, whereas the Law mentions that "the King determines the maximum supplement to be charged in a single and two-person room".

[oo] Royal Decree of June 14, 2006 implementing art 77 of the Program Law of December 27, 2005. Into force since July 1, 2006.

1.7.4 Other supplements

In this paragraph, we describe various supplements mostly generated during hospitalisation.

1.7.4.1 Medicine supplements

In order to promote generic prescribing, the reimbursement of brand drugs for which a generic substitute exists is limited to the reimbursement level for the generic drug. This so-called reference pricing scheme was introduced in 2001, both for hospitalised and ambulatory patients. In ambulatory setting, the difference is paid by the patient. For hospitalized patients the out-of-pocket payment of the patient for reimbursed drugs is always limited to a lump sum price per day. In case the hospital prescribes a brand drug for which a lower priced generic exists, the difference due to the reference reimbursement is at its own charge. In our empirical analysis this payment is *regarded as a co-payment and NOT as a supplement*. First, because of accounting rules and the aggregation of the detailed product codes of the medicines, we were not able to make a distinction between the co-payment and the supplement in our data. Moreover, this choice can be justified by the decision of the Belgian government to take up this supplement due to the reference price scheme in the maximum billing.

Drugs of category D (the so-called OTC drugs) are not reimbursed, not even during hospitalisation. These drugs however appear on the hospital bill and are in that case denoted as supplements.

The official tariff of the co-payment and the reimbursement rate are fixed for drugs in the ambulatory sector and for day hospitalisations. We have different rates according to the reimbursement category of the drugs which depends on the pharmaco-therapeutic value of the drug and according to the patient category (with or without preferential treatment). For inpatient hospitalisations[pp] patients are charged €0.62 per day for reimbursable drugs irrespective of the actual consumption[qq]. Since July 1, 2006 the financing system for drugs used during inpatient hospitalisation in general hospitals changed fundamentally[rr]. A large part of hospital drugs are now financed on a lump sum basis replacing the fee for service practice. However, there are no major changes for the patients. Their co-payment remains €0.62 per day. In a psychiatric hospital the daily lump sum equals €0.80. In the ambulatory sector supplements are not allowed[ss].

1.7.4.2 Supplements for parapharmaceutical products

Inpatients can be charged for certain products delivered by the hospital pharmacist, but which are not pharmaceutical specialties, e.g. a personal thermometer, anti-decubitus materials, lip salve and bath oil. They are referred to as parapharmaceutical supplements.

1.7.4.3 Diverse supplements

This category contains charges for non-medical products or services, such as telephone, television, refrigerator, bed for accompanying person, drinks outside the meals, hairdresser, laundry... However, the interpretation of the item "diverse supplements" in our data is ambiguous, because it depends on the different accounting practices of the hospitals. In fact, some hospitals include medical care items under the heading of "diverse supplements".

[pp] Including day hospitalisations in a surgical day centre.

[qq] Royal Decree of May 7, 1991.

[rr] For more details see (RIZIV, 2006)[11].

[ss] Law of 14/07/94, art 37 §3. However, in the empirical analysis of chapter 2 we have supplements on medicines in the ambulatory sector because our subcategory 'ambulatory medicines' is much broader than what we usually mean by 'medicines' and includes pharmaceutical products such as enteral feeding, mother's milk, oxygen, blood and blood products.

Table 3 summarises the most important aspects of the regulation with respect to supplements.

Table 3: Summary of regulation with respect to supplements (2003)

	Type of room		
Type of supplement	Common room	2-person room	Single room
Fee supplement			
Physician acceded	No	No	Yes
Physician not acceded	Yes, but protected persons	Yes, but protected persons	Yes
Paramedical acceded	No	No	No
Paramedical not acceded	Yes	Yes	Yes
Room supplement	No	Yes, but limited	Yes
Material supplement			
Article 28	Yes, difference between purchase price and reimbursement		
Article 35	No, in case of lump sum reimbursement; Yes otherwise, difference between purchase price and reimbursement with safety margin		
Article 35bis	No, in case of lump sum reimbursement; Yes otherwise, difference between purchase price and reimbursement with safety margin		
Other supplements inpatients	Yes, for used/ordered items		

Key points

- **In the Belgian health care system patients pay co-payments and supplements. For health care items included in the compulsory cover, supplements are defined as the difference between total payments and the convention tariff. For health care items not included in the compulsory cover, supplements are equal to the total payments of the patient.**
- **Supplements have increased considerably in recent years, especially fee and material supplements.**
- **Special measures protect some vulnerable groups from high co-payments. Supplements can be charged on top of co-payments, but legislative rules limit the possibilities for further increases.**
- **Physicians who reject the convention can charge supplements in all room types, but vulnerable groups are protected in two-person and common rooms. Physicians who join the agreement can charge fee supplements only in single rooms.**
- **Room supplements can be charged in single or two-person rooms. The room supplement in two-person rooms is limited (since 2002) and is abolished for vulnerable groups (since July 2006).**
- **Material supplements can be charged for the difference between the purchase price and the reimbursement by RIZIV/INAMI. Recently gradually more protection is given by reimbursing material on a lump sum basis with no supplement and by specifying safety margins.**
- **The available data give a reasonable picture of hospital supplements. The data for ambulatory supplements are incomplete and so less reliable.**

2 AN EMPIRICAL ANALYSIS OF THE DETERMINANTS AND DISTRIBUTION OF SUPPLEMENTS IN BELGIUM (2003)

2.1 INTRODUCTION

Before one can make any serious statements about the social consequences of supplements and their impact on the financial accessibility of the health care sector, a necessary first step is to get a better insight into the simple factual questions about the distribution of the supplements in the population. Who pays supplements? To answer this question one needs detailed information at the level of the individual persons. In this chapter, which is the core of the report, we will analyse from that perspective the large dataset with administrative data, which has been described in the previous chapter.

We will go somewhat further than a mere description, as we will also try to get a better insight into the determinants of the inter-individual variation in supplements paid. For this reason, it is useful to distinguish four sets of explanatory factors:

- morbidity (captured e.g. by age and invalidity indicators). It is self-evident that the larger the health care needs, the larger the out-of-pocket payments.
- regulatory framework. Since regulatory measures have a different impact on different groups (as described in Chapter 1), they obviously may have a crucial influence on the distribution of out-of-pocket payments. The most important example is the preferential treatment, which will therefore play a prominent role in the following analysis.
- supply factors. It is well known that (even for given morbidity) there are differences in health care costs which can be explained by regional practice variations, by medical supply, by the differences in behaviour of different hospitals. In the case of supplements, the decision freedom of providers is in some sense even larger. We will therefore analyse explicitly these supply-side effects.
- own choices of the patients. In Belgium patients are free to choose the GP or specialist they want to consult. In some cases "price" differences are well known by many patients (e.g. in the case of orthodontics). Patients also have a large influence on the choice between a single room, a two-person room and a common room or in the decision whether or not to go to a private hospital. These choices may have an important effect on their out-of-pocket payments.

Moreover, supplements have two interrelated but conceptually different effects on the individual patients:

Supplements increase the price of specific individual services. This is especially striking in the case of hospital stays, but may also be relevant, e.g. for some ambulatory consultations. Different individuals will probably react differently to such price increases. In some cases the price effect may induce postponement of necessary care. Remember, however, that with the available data it is nearly impossible for us to derive any conclusions about behavioural reactions. We will only be able to formulate some provisional hypotheses in this regard.

Supplements will also increase the total financial burden of the patients. Mainly for the chronically ill, the sum of many relatively "small" price increases may add up to a considerable amount. This total burden may not only have consequences for the accessibility of health care, it may also have a negative effect on individual living standards and maybe even push some individuals into poverty. While we do not have any information about the income position of individuals, we will nevertheless spend

much attention to the distribution of the total sum of out-of-pocket payments and to the effects of supplements on this total sum.

We will distinguish between these effects as carefully as possible.

As already mentioned in the previous chapter, we will stay rather close to the administrative distinctions that are present in the IMA-data. This has been a deliberate choice. On the one hand, it has the disadvantage that our variables are less closely linked to the traditional sociological definitions of socio-economic groups. Moreover, individuals that fall just outside the definition of an administrative category are not included, although their health risk and/or socio-economic position may be very similar. On the other hand, it has the advantage that the results are more informative on the efficacy of the regulatory framework and therefore also yield useful information on possible desirable changes in that framework. Moreover, sticking to the administrative definitions minimizes the possible confusion in the interpretation of the results. Grouping the individuals in homogeneous socio-economic groups on the basis of the administrative information given in the data turned out to be a very hazardous exercise.

In this chapter, we will leave aside the questions about supplemental hospital insurance. This does not in the least influence the interpretation of our results in terms of the variation of individual supplements as a function of individual characteristics of the patients or in terms of the variation in supply-side behaviour. Quite the contrary, to get a good idea of the latter it is necessary to investigate the supplements raised as such. However, if interpreted from the point of view of the financial consequences for the individual patients, neglecting the possible coverage by supplemental insurance is a crucial weakness. From that perspective, all results in this chapter have to be read as "as if"-statements: we describe the distribution of supplements (and, more generally, of out-of-pocket payments) as if everybody has to pay her out-of-pocket payments really out of her own pocket. We will take up the issue of supplemental hospital insurance in chapter 3.

2.2 WHO PAYS SUPPLEMENTS? OUT-OF-POCKET PAYMENTS IN THE POPULATION

In this section, we will first sketch a general picture of the total amounts of supplements paid. We will then show how these are distributed over different groups of the population and finally focus on the characteristics of the extreme payers. The analysis in this section is purely descriptive. Moreover, we only look at the total amount of supplements (and co-payments) without disaggregating over different categories of expenditures. Such a more disaggregated analysis follows in the next section.

2.2.1 The distribution of supplements in the population (figures 2 and 3, tables 4, 5 and 6)

Figure 2 gives a general idea about the distribution of total supplements per year in the population. The blue bars show the distribution of total supplements, the red bars the one of supplements in the ambulatory sector, the yellow bars the one of supplements in the hospital sector. To make it easier to read the figure, we dropped the bar corresponding to zero supplements: this applies to 60% of the sample. It turns out that an additional 18% of our sample has supplements ≤ €10. It is obvious therefore that for most people, the average amount of supplements paid per year is small. At the same time, however, in some cases the supplements to be paid are large. Note that even rather small percentages represent a vast number of people: about 300,000 individuals pay more than €500 and 137,000 individuals even more than €1,000. Remember, however, that this does not necessarily reflect a personal financial burden, since at this stage we do not correct for the availability of supplemental hospital insurance (for which see chapter 3).

Figure 2 also gives an indication about the relative importance of supplements in the ambulatory and in the hospital sector. For small amounts, the distribution of total supplements almost coincides with the one of the ambulatory supplements. It is striking that the distribution of hospital supplements is very different with a much larger number

of observations in the right tail of the distribution. This is not surprising: it is to be expected that larger supplements are paid during stays in the hospital. We will come back to this later. At the same time, however, our data (and therefore also Figure 2) may give a slightly biased picture of reality. As explained in chapter 1, the information of the sickness funds about ambulatory supplements is significantly less reliable than the one about hospital supplements and gives almost certainly an underestimation of the actual supplements.

As mentioned in the introduction, the supplements should be related to the co-payments if we want to derive conclusions about total out-of-pocket payments – and hence about the financial accessibility of the health care sector. A first rough comparison of the distributions of supplements and co-payments is shown in Figure 3. The blue bars show the distribution of the supplements, the green bars the distribution of the co-payments. In this case we did not omit the bar for zero supplements (and co-payments). Indeed, there is only a small fraction of the sample (6.5%) who does not pay any co-payments at all. Moreover, average co-payments are much larger than average supplements.

Figure 3 gives only a rough picture for two reasons. First, to calculate out-of-pocket payments we have to consider the joint distribution of co-payments and supplements: are the same people paying large co-payments and large supplements at the same time? Second, the figure includes all co-payments. It therefore gives an overestimate of what patients really pay, because the maximum billing (MaB)-regulation introduces a ceiling for the co-payments (at least for the health care items that are included in the MaB). With the available data, we cannot perfectly impute the effects of the MaB. Indeed, while we have detailed information about the individual co-payments, we do not have data on total co-payments at the level of the sociological household – and therefore we cannot know what expenditures have lifted individual patients above the thresholds. However, we have some information in the database which allows us to approximate the effects of the MaB in a reasonable way[tt].

Table 4a shows the joint distribution of supplements and co-payments[uu] in what we consider to be the best (in any case the most likely) approximation of the MaB that is possible with our data. We therefore call it the realistic scenario. The data allow us to split (for each individual) the co-payments in two parts: co-payments which are included in the MaB and co-payments which are not. Of course, the latter part is always included in the co-payments to be paid. The former part is adjusted as follows. We know from the data whether a household qualified for MaB reimbursements and if yes, with which threshold (€450 or €650). If the household qualified for MaB reimbursements, we reduce the total co-payments to the relevant threshold. Bringing together the two parts, this thus means that we assume that the individual has to pay the threshold (€450 or €650) plus the co-payments which are not included in the MaB. This is still an overestimate of the true co-payments, because the threshold is applied at the household level and not at the individual level. Moreover, we cannot take into account the effects of the fiscal MaB as we have no detailed information on the level of personal income.

The interpretation of Table 4a is straightforward. Consider for instance the upper left cell. The second number in the cell shows that 6.46% of the sample does not pay any co-payments or supplements. Using the sample weights[vv] we can estimate that this corresponds to 592,880 individuals. Of those who pay zero co-payments, 99.55% does not pay any supplements (this is the row percentage). Of those who pay zero supplements, 10.8% pay also zero co-payments (this is the column percentage). The

[tt] One could argue that in a complete analysis also the effect of the different lump sum subsidies (see chapter 1) should have been taken into account. However, precisely the lump sum feature of these compensations makes them very similar to income transfers, which we do not consider in this report. Moreover, introducing them in the figures and tables of this section does not at all change the overall picture of the results.

[uu] The categories are defined somewhat differently in the Tables and in the Figures. The format of the Tables indeed gives us the opportunity to show more details about the large amounts. These details are not visible on the Figures.

[vv] We use a factor of 20 for individuals aged 65 or more. For the others we use a weight of 40. More detailed information on the sample selection can be found in the Technical Note in Appendix 1.

column totals give the distribution of supplements (and therefore coincide with the blue bars in Figures 2 and 3), the row totals give the distribution of the co-payments.

To get some additional insights and because the approximation applied in Table 4a is imperfect, we also show the results for two other scenarios. Table 5a gives the joint distribution of co-payments and supplements in an optimistic scenario where the lower threshold of €450 is applied to all individuals, i.e. where for each individual the co-payments are calculated as the maximum ((co-payments in MaB), €450) + (co-payments not in MaB). Table 6a shows the joint distribution for a pessimistic scenario in which we do as if the MaB did not exist, i.e. in which we simply consider the distribution of the uncorrected co-payments. Note that the row totals in this case correspond to the green bars in Figure 3.

Looking first at the realistic scenario in Table 4a, the connection between co-payments and supplements is clear (and not surprising). The number of people with large supplements and small co-payments (the upper right region in the table) is minimal. On the other hand, there are many individuals who pay relatively large co-payments but only minimal supplements. This was to be expected on the basis of Figure 3. Overall, there is a positive correlation between co-payments and supplements to be paid. It is important to keep this in mind in our further analyses. We have already seen in Figure 2 that the average level of supplements is not very large and that they probably do not create severe problems for the majority of the population. However, Figure 2 also showed that for some patients the supplements are large. Table 4a now clearly indicates that for most of these individuals the large supplements come on top of significant co-payments (even after taking into account the MaB). We will return to the characteristics of these extreme payers later in this section.

Tables 4b, 5b and 6b present the same information in a more condensed way: the number of co-payment and supplement categories has been reduced and the cells only contain the number of individuals – in yellow, if they belong to the group of high payers, in brown if they belong to the group of extreme payers, and without a colour for the others.

It is interesting to compare the results for the realistic scenario (Table 4b) with those for the pessimistic scenario (Table 6b), since the latter can be interpreted as a description of what would be the out-of-pocket payments without the MaB regulation. The comparison therefore gives us some indication of the effects of the MaB: of course these are minor for low co-payments, but they become rather significant for large values. In fact, without the MaB there would be 559,460 patients with co-payments larger than €500, in the realistic scenario this number is reduced to 452,900. In a certain sense, this increases the importance of the supplements from the point of view of the accessibility of the health care sector. Indeed, there is no ceiling for the supplements. Because of the MaB, the number of extreme payers is reduced with 15% from 372,780 to 317,460. In the hypothetical situation where everybody is entitled to the MaB ceiling of €450 (i.e. optimistic scenario in Table 5b), this number of patients is further reduced to 259,640.

Figure 2: Distribution of yearly supplements in the population

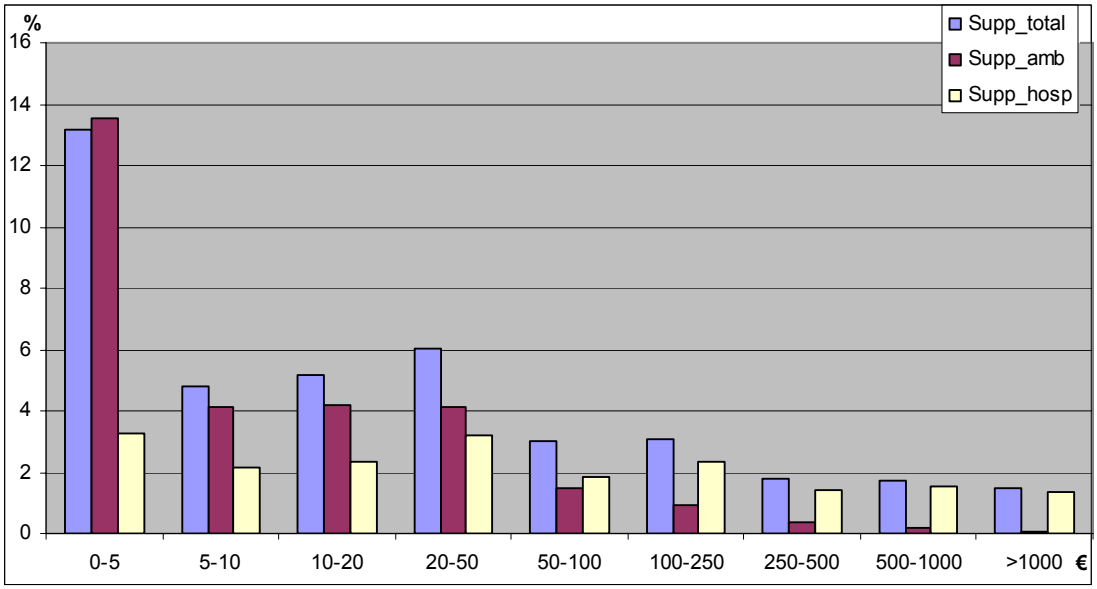


Figure 3: Distribution of yearly supplements and co-payments in the population (pessimistic scenario)

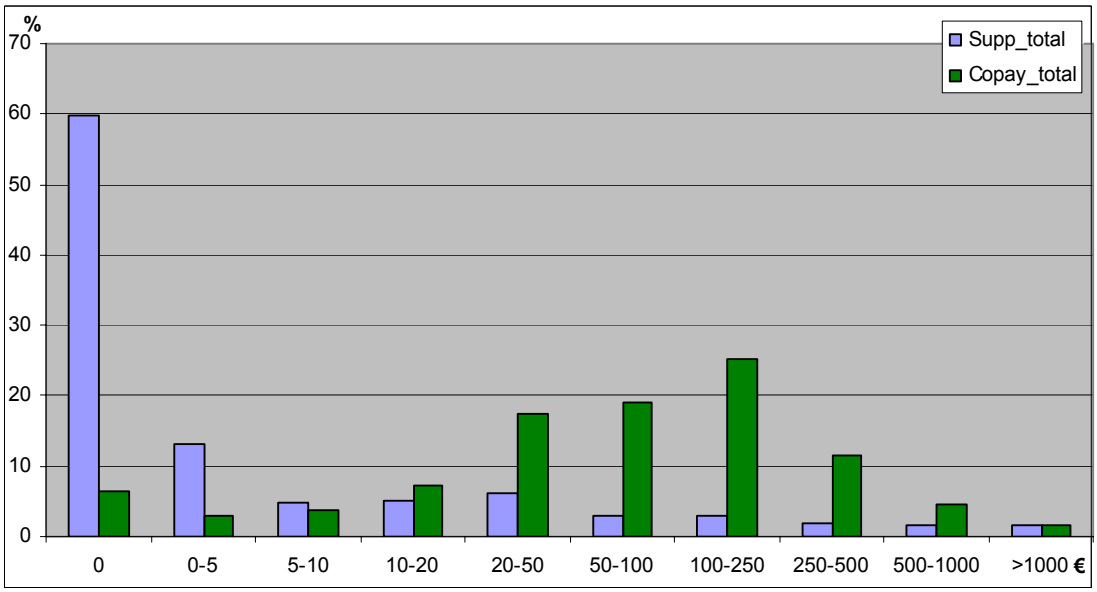


Table 4a: Joint distribution of yearly supplements and co-payments : realistic scenario

Co-payment (including MaB for those who received money)

Frequency / Percent / Row Pct / Col Pct	supplements															
	0	0-5	5-10	10-20	20-50	50-100	100-250	250-500	500-750	750-1000	1000-2000	2000-3000	3000-4000	4000-5000	>5000	Total
0	592,880	1,220	360	360	240	220	60	140	0	0	**40**	**60**	**0**	**0**	**0**	595,580
	6.46	0.01	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	6.49
	99.55	0.2	0.06	0.06	0.04	0.04	0.01	0.02	0	0	**0.01**	**0.01**	**0**	**0**	**0**	
	10.8	0.1	0.08	0.08	0.04	0.08	0.02	0.09	0	0	**0.04**	**0.22**	**0**	**0**	**0**	
0-5	246,400	15,980	1,500	1,820	1,140	260	380	80	20	40	**100**	**20**	**20**	**0**	**0**	267,760
	2.68	0.17	0.02	0.02	0.01	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	2.92
	92.02	5.97	0.56	0.68	0.43	0.1	0.14	0.03	0.01	0.01	**0.04**	**0.01**	**0.01**	**0**	**0**	
	4.49	1.32	0.34	0.39	0.21	0.09	0.13	0.05	0.02	0.06	**0.11**	**0.07**	**0.21**	**0**	**0**	
5-10	298,320	32,840	4,780	3,460	1,960	440	440	200	60	20	**100**	**40**	**80**	**0**	**20**	342,760
	3.25	0.36	0.05	0.04	0.02	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	3.73
	87.03	9.58	1.39	1.01	0.57	0.13	0.13	0.06	0.02	0.01	**0.03**	**0.01**	**0.02**	**0**	**0.01**	
	5.44	2.72	1.09	0.73	0.35	0.16	0.16	0.12	0.06	0.03	**0.11**	**0.14**	**0.86**	**0**	**0.3**	
10-20	548,660	87,480	15,380	11,180	6,800	1,600	1,200	360	140	40	**200**	**100**	**80**	**20**	**60**	673,300
	5.98	0.95	0.17	0.12	0.07	0.02	0.01	0	0	0	**0**	**0**	**0**	**0**	**0**	7.34
	81.49	12.99	2.28	1.66	1.01	0.24	0.18	0.05	0.02	0.01	**0.03**	**0.01**	**0.01**	**0**	**0.01**	
	10	7.24	3.51	2.37	1.23	0.58	0.43	0.22	0.14	0.06	**0.22**	**0.36**	**0.86**	**0.48**	**0.91**	
20-50	1,157,000	269,120	67,860	55,000	40,820	10,620	7,000	2,020	600	220	**420**	**140**	**140**	**0**	**80**	1,611,040
	12.61	2.93	0.74	0.6	0.44	0.12	0.08	0.02	0.01	0	**0**	**0**	**0**	**0**	**0**	17.55
	71.82	16.7	4.21	3.41	2.53	0.66	0.43	0.13	0.04	0.01	**0.03**	**0.01**	**0.01**	**0**	**0**	
	21.08	22.28	15.47	11.66	7.36	3.86	2.48	1.23	0.62	0.35	**0.47**	**0.5**	**1.5**	**0**	**1.21**	
50-100	1,083,120	304,060	107,020	104,180	91,380	26,860	17,980	7,300	1,900	1,000	**1,580**	**280**	**20**	**40**	**20**	1,746,740
	11.8	3.31	1.17	1.14	1	0.29	0.2	0.08	0.02	0.01	**0.02**	**0**	**0**	**0**	**0**	19.03
	62.01	17.41	6.13	5.96	5.23	1.54	1.03	0.42	0.11	0.06	**0.09**	**0.02**	**0**	**0**	**0**	
	19.73	25.18	24.4	22.09	16.48	9.77	6.38	4.44	1.96	1.61	**1.77**	**1.01**	**0.21**	**0.96**	**0.3**	
100-250	1,131,080	360,920	165,820	186,960	225,420	94,380	72,600	36,280	18,320	9,040	**10,320**	**2,520**	**480**	**120**	**160**	2,314,420
	12.32	3.93	1.81	2.04	2.46	1.03	0.79	0.4	0.2	0.1	**0.11**	**0.03**	**0.01**	**0**	**0**	25.22
	48.87	15.59	7.16	8.08	9.74	4.08	3.14	1.57	0.79	0.39	**0.45**	**0.11**	**0.02**	**0.01**	**0.01**	
	20.61	29.88	37.81	39.64	40.66	34.32	25.76	22.08	18.95	14.52	**11.59**	**9.06**	**5.14**	**2.87**	**2.42**	
250-500	365,140	115,860	62,640	87,580	142,380	100,440	115,680	63,960	42,160	**30,120**	**35,080**	**8,680**	**2,100**	**660**	**980**	1,173,460
	3.98	1.26	0.68	0.95	1.55	1.09	1.26	0.7	0.46	**0.33**	**0.38**	**0.09**	**0.02**	**0.01**	**0.01**	12.79
	31.12	9.87	5.34	7.46	12.13	8.56	9.86	5.45	3.59	**2.57**	**2.99**	**0.74**	**0.18**	**0.06**	**0.08**	
	6.65	9.59	14.28	18.57	25.68	36.52	41.04	38.93	43.6	**48.36**	**39.41**	**31.22**	**22.48**	**15.79**	**14.8**	
500-750	54,000	16,380	10,640	16,420	33,880	29,160	45,180	33,160	**20,520**	**13,120**	**22,640**	**7,200**	**2,280**	**1,540**	**1,500**	307,620
	0.59	0.18	0.12	0.18	0.37	0.32	0.49	0.36	**0.22**	**0.14**	**0.25**	**0.08**	**0.02**	**0.02**	**0.02**	3.35
	17.55	5.32	3.46	5.34	11.01	9.48	14.69	10.78	**6.67**	**4.27**	**7.36**	**2.34**	**0.74**	**0.5**	**0.49**	
	0.98	1.36	2.43	3.48	6.11	10.6	16.03	20.19	**21.22**	**21.07**	**25.43**	**25.9**	**24.41**	**36.84**	**22.66**	
750-1000	7,180	2,720	1,700	2,940	6,620	6,640	12,040	**10,980**	**6,320**	**4,260**	**8,600**	**4,260**	**1,360**	**700**	**960**	77,280
	0.08	0.03	0.02	0.03	0.07	0.07	0.13	**0.12**	**0.07**	**0.05**	**0.09**	**0.05**	**0.01**	**0.01**	**0.01**	0.84
	9.29	3.52	2.2	3.8	8.57	8.59	15.58	**14.21**	**8.18**	**5.51**	**11.13**	**5.51**	**1.76**	**0.91**	**1.24**	
	0.13	0.23	0.39	0.62	1.19	2.41	4.27	**6.68**	**6.54**	**6.84**	**9.66**	**15.32**	**14.56**	**16.75**	**14.5**	
1000-2000	3,660	1,100	760	1,540	3,140	3,940	8,280	8,160	5,460	3,560	7,420	3,500	2,100	740	1,840	55,200
	0.04	0.01	0.01	0.02	0.03	0.04	0.09	0.09	0.06	0.04	0.08	0.04	0.02	0.01	0.02	0.6
	6.63	1.99	1.38	2.79	5.69	7.14	15	14.78	9.89	6.45	13.44	6.34	3.8	1.34	3.33	
	0.07	0.09	0.17	0.33	0.57	1.43	2.94	4.97	5.65	5.72	8.34	12.59	22.48	17.7	27.79	
2000-3000	360	60	100	80	320	320	700	980	760	540	1,460	560	400	300	680	7,620
	0	0	0	0	0	0	0.01	0.01	0.01	0.01	0.02	0.01	0	0	0.01	0.08
	4.72	0.79	1.31	1.05	4.2	4.2	9.19	12.86	9.97	7.09	19.16	7.35	5.25	3.94	8.92	
	0.01	0	0.02	0.02	0.06	0.12	0.25	0.6	0.79	0.87	1.64	2.01	4.28	7.18	10.27	
3000-4000	200	0	20	40	60	20	160	480	160	140	260	140	100	20	260	2,060
	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0.02
	9.71	0	0.97	1.94	2.91	0.97	7.77	23.3	7.77	6.8	12.62	6.8	4.85	0.97	12.62	
	0	0	0	0.01	0.01	0.01	0.06	0.29	0.17	0.22	0.29	0.5	1.07	0.48	3.93	
4000-5000	440	0	0	100	80	120	160	100	240	100	740	220	160	40	60	2,560
	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0.03
	17.19	0	0	3.91	3.13	4.69	6.25	3.91	9.38	3.91	28.91	8.59	6.25	1.56	2.34	
	0.01	0	0	0.02	0.01	0.04	0.06	0.06	0.25	0.16	0.83	0.79	1.71	0.96	0.91	
>5000	60	20	20	0	100	0	0	80	40	80	60	80	20	0	0	560
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
	10.71	3.57	3.57	0	17.86	0	0	14.29	7.14	14.29	10.71	14.29	3.57	0	0	
	0	0	0	0	0.02	0	0	0.05	0.04	0.13	0.07	0.29	0.21	0	0	
Total	5,488,500	1,207,760	438,600	471,660	554,340	275,020	281,860	164,280	96,700	62,280	89,020	27,800	9,340	4,180	6,620	9,177,960
	59.8	13.16	4.78	5.14	6.04	3	3.07	1.79	1.05	0.68	0.97	0.3	0.1	0.05	0.07	100

Table 4b: Joint distribution of yearly supplements and co-payments : realistic scenario

		Supplements					
		0-100	100-250	250-500	500-1000	>1000	Total
Co-payment (including MaB for those who received money)	0-100	5,192,320	27,060	8,120	0	0	5,227,500
		0	0	1,980	3,680	0	5,660
		0	0	0	360	3,660	4,020
	100-250	2,164,580	72,600	13,920	0	0	2,251,100
		0	0	22,360	20,880	0	43,240
		0	0	0	6,480	13,600	20,080
	250-500	830,360	41,440	0	0	0	871,800
		43,680	74,240	63,960	21,880	0	203,760
		0	0	0	50,400	47,500	97,900
	500-1000	0	0	0	0	0	0
		186,680	50,800	19,960	0	0	257,440
		1,600	6,420	24,180	44,220	51,040	127,460
	>1000	0	0	0	0	0	0
		0	0	0	0	0	0
		16,660	9,300	9,800	11,080	21,160	68,000
	total	8,187,260	141,100	22,040	0	0	8,350,400
		230,360	125,040	108,260	46,440	0	510,100
		18,260	15,720	33,980	112,540	136,960	317,460

Table 5a: Joint distribution of yearly supplements and co-payments : optimistic scenario

Co-payments including MaB for everyone

Frequency / Percent / Row Pct / Col Pct	supplements															
	0	0-5	5-10	10-20	20-50	50-100	100-250	250-500	500-750	750-1000	1000-2000	2000-3000	3000-4000	4000-5000	>5000	Total
0	592,880	1,220	360	360	240	220	60	140	0	0	**40**	**60**	**0**	**0**	**0**	595,580
	6.46	0.01	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	6.49
	99.55	0.2	0.06	0.06	0.04	0.04	0.01	0.02	0	0	**0.01**	**0.01**	**0**	**0**	**0**	
	10.8	0.1	0.08	0.08	0.04	0.08	0.02	0.09	0	0	**0.04**	**0.22**	**0**	**0**	**0**	
0-5	246,400	15,980	1,500	1,820	1,140	260	380	80	20	40	**100**	**20**	**20**	**0**	**0**	267,760
	2.68	0.17	0.02	0.02	0.01	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	2.92
	92.02	5.97	0.56	0.68	0.43	0.1	0.14	0.03	0.01	0.01	**0.04**	**0.01**	**0.01**	**0**	**0**	
	4.49	1.32	0.34	0.39	0.21	0.09	0.13	0.05	0.02	0.06	**0.11**	**0.07**	**0.21**	**0**	**0**	
5-10	298,320	32,840	4,780	3,460	1,960	440	440	200	60	20	**100**	**40**	**80**	**0**	**20**	342,760
	3.25	0.36	0.05	0.04	0.02	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	3.73
	87.03	9.58	1.39	1.01	0.57	0.13	0.13	0.06	0.02	0.01	**0.03**	**0.01**	**0.02**	**0**	**0.01**	
	5.44	2.72	1.09	0.73	0.35	0.16	0.16	0.12	0.06	0.03	**0.11**	**0.14**	**0.86**	**0**	**0.3**	
10-20	548,660	87,480	15,380	11,180	6,800	1,600	1,200	360	140	40	**200**	**100**	**80**	**20**	**60**	673,300
	5.98	0.95	0.17	0.12	0.07	0.02	0.01	0	0	0	**0**	**0**	**0**	**0**	**0**	7.34
	81.49	12.99	2.28	1.66	1.01	0.24	0.18	0.05	0.02	0.01	**0.03**	**0.01**	**0.01**	**0**	**0.01**	
	10	7.24	3.51	2.37	1.23	0.58	0.43	0.22	0.14	0.06	**0.22**	**0.36**	**0.86**	**0.48**	**0.91**	
20-50	1,157,000	269,120	67,860	55,000	40,820	10,620	7,000	2,020	600	220	**420**	**140**	**140**	**0**	**80**	1,611,040
	12.61	2.93	0.74	0.6	0.44	0.12	0.08	0.02	0.01	0	**0**	**0**	**0**	**0**	**0**	17.55
	71.82	16.7	4.21	3.41	2.53	0.66	0.43	0.13	0.04	0.01	**0.03**	**0.01**	**0.01**	**0**	**0**	
	21.08	22.28	15.47	11.66	7.36	3.86	2.48	1.23	0.62	0.35	**0.47**	**0.5**	**1.5**	**0**	**1.21**	
50-100	1,083,120	304,060	107,020	104,180	91,380	26,860	17,980	7,300	1,900	1,000	**1,580**	**280**	**20**	**40**	**20**	1,746,740
	11.8	3.31	1.17	1.14	1	0.29	0.2	0.08	0.02	0.01	**0.02**	**0**	**0**	**0**	**0**	19.03
	62.01	17.41	6.13	5.96	5.23	1.54	1.03	0.42	0.11	0.06	**0.09**	**0.02**	**0**	**0**	**0**	
	19.73	25.18	24.4	22.09	16.48	9.77	6.38	4.44	1.96	1.61	**1.77**	**1.01**	**0.21**	**0.96**	**0.3**	
100-250	1,131,080	360,920	165,820	186,960	225,420	94,380	72,600	36,280	18,320	9,040	**10,320**	**2,520**	**480**	**120**	**160**	2,314,420
	12.32	3.93	1.81	2.04	2.46	1.03	0.79	0.4	0.2	0.1	**0.11**	**0.03**	**0.01**	**0**	**0**	25.22
	48.87	15.59	7.16	8.08	9.74	4.08	3.14	1.57	0.79	0.39	**0.45**	**0.11**	**0.02**	**0.01**	**0.01**	
	20.61	29.88	37.81	39.64	40.66	34.32	25.76	22.08	18.95	14.52	**11.59**	**9.06**	**5.14**	**2.87**	**2.42**	
250-500	416,000	130,620	72,660	102,460	174,900	127,820	155,220	90,580	57,880	**41,020**	**54,240**	**15,280**	**4,680**	**1,780**	**2,920**	1,448,060
	4.53	1.42	0.79	1.12	1.91	1.39	1.69	0.99	0.63	**0.45**	**0.59**	**0.17**	**0.05**	**0.02**	**0.03**	15.78
	28.73	9.02	5.02	7.08	12.08	8.83	10.72	6.26	4	**2.83**	**3.75**	**1.06**	**0.32**	**0.12**	**0.2**	
	7.58	10.82	16.57	21.72	31.55	46.48	55.07	55.14	59.86	**65.86**	**60.93**	**54.96**	**50.11**	**42.58**	**44.11**	
500-750	14,280	5,260	3,060	5,800	10,860	11,700	24,720	24,120	**15,440**	**9,660**	**18,140**	**7,780**	**2,940**	**1,660**	**2,420**	157,840
	0.16	0.06	0.03	0.06	0.12	0.13	0.27	0.26	**0.17**	**0.11**	**0.2**	**0.08**	**0.03**	**0.02**	**0.03**	1.72
	9.05	3.33	1.94	3.67	6.88	7.41	15.66	15.28	**9.78**	**6.12**	**11.49**	**4.93**	**1.86**	**1.05**	**1.53**	
	0.26	0.44	0.7	1.23	1.96	4.25	8.77	14.68	**15.97**	**15.51**	**20.38**	**27.99**	**31.48**	**39.71**	**36.56**	
750-1000	340	240	100	200	480	820	1,440	**1,800**	**1,240**	**560**	**1,740**	**920**	**380**	**420**	**580**	11,260
	0	0	0	0	0.01	0.01	0.02	**0.02**	**0.01**	**0.01**	**0.02**	**0.01**	**0**	**0**	**0.01**	0.12
	3.02	2.13	0.89	1.78	4.26	7.28	12.79	**15.99**	**11.01**	**4.97**	**15.45**	**8.17**	**3.37**	**3.73**	**5.15**	
	0.01	0.02	0.02	0.04	0.09	0.3	0.51	**1.1**	**1.28**	**0.9**	**1.95**	**3.31**	**4.07**	**10.05**	**8.76**	
1000-2000	60	20	40	140	60	200	620	1,040	720	440	1,240	300	380	120	300	5,680
	0	0	0	0	0	0	0.01	0.01	0.01	0	0.01	0	0	0	0	0.06
	1.06	0.35	0.7	2.46	1.06	3.52	10.92	18.31	12.68	7.75	21.83	5.28	6.69	2.11	5.28	
	0	0	0	0	0	0	0	1	1	1	1	1	4	3	5	
2000-3000	40	0	0	0	120	0	60	100	60	80	120	80	20	20	60	760
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
	5.26	0	0	0	15.79	0	7.89	13.16	7.89	10.53	15.79	10.53	2.63	2.63	7.89	
	0	0	0	0	0.02	0	0.02	0.06	0.06	0.13	0.13	0.29	0.21	0.48	0.91	
3000-4000	0	0	20	0	40	20	40	120	40	40	60	40	0	0	0	420
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	4.76	0	9.52	4.76	9.52	28.57	9.52	9.52	14.29	9.52	0	0	0	
	0	0	0	0	0.01	0.01	0.01	0.07	0.04	0.06	0.07	0.14	0	0	0	
4000-5000	280	0	0	100	80	80	100	140	240	60	660	200	100	0	0	2,040
	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0.02
	13.73	0	0	4.9	3.92	3.92	4.9	6.86	11.76	2.94	32.35	9.8	4.9	0	0	
	0.01	0	0	0.02	0.01	0.03	0.04	0.09	0.25	0.1	0.74	0.72	1.07	0	0	
>5000	40	0	0	0	40	0	0	0	40	60	60	40	20	0	0	300
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13.33	0	0	0	13.33	0	0	0	13.33	20	20	13.33	6.67	0	0	
	0	0	0	0	0.01	0	0	0	0.04	0.1	0.07	0.14	0.21	0	0	
Total	5,488,500	1,207,760	438,600	471,660	554,340	275,020	281,860	164,280	96,700	62,280	89,020	27,800	9,340	4,180	6,620	9,177,960
	59.8	13.16	4.78	5.14	6.04	3	3.07	1.79	1.05	0.68	0.97	0.3	0.1	0.05	0.07	100

Table 5b: Joint distribution of yearly supplements and co-payments : optimistic scenario

		Supplements					
		0-100	100-250	250-500	500-1000	>1000	Total
Co-payments including MaB for everyone	0-100	5,192,320	27,060	8,120		0	5,227,500
		0	0	1,980	3,680	0	5,660
		0	0	0	360	3,660	4,020
	100-250	2,164,580	72,600	13,920		0	2,251,100
		0	0	22,360	20,880	0	43,240
		0	0	0	6,480	13,600	20,080
	250-500	836,800	41,440	0		0	991,360
		74,540	113,780	90,580	25,100	0	304,000
		0	0	0	73,800	78,900	152,700
	500-1000	949,920	41,440	0		0	0
		53,000	25,460	17,000	0	0	95,460
		140	700	8,920	26,900	36,980	73,640
	>1000	0	0	0		0	8,080
		0	0	0	0	0	0
		1,380	820	1,400	1,780	3,820	9,200
	total	8,306,820	141,100	22,040	0	0	8,469,960
		127,540	139,240	131,920	49,660	0	448,360
		1,520	1,520	10,320	109,320	136,960	259,640

Table 6a: Joint distribution of yearly supplements and co-payments : pessimistic scenario (i.e. without MaB)

Co-payments: Frequency / Percent / Row Pct / Col Pct	supplements: 0	0-5	5-10	10-20	20-50	50-100	100-250	250-500	500-750	750-1000	1000-2000	2000-3000	3000-4000	4000-5000	>5000	Total
0	592,960	1,280	400	380	300	280	120	240	100	120	**540**	**200**	**200**	**20**	**0**	597,140
	6.46	0.01	0	0	0	0	0	0	0	0	**0.01**	**0**	**0**	**0**	**0**	6.51
	99.3	0.21	0.07	0.06	0.05	0.05	0.02	0.04	0.02	0.02	**0.09**	**0.03**	**0.03**	**0**	**0**	
	10.8	0.11	0.09	0.08	0.05	0.1	0.04	0.15	0.1	0.19	**0.61**	**0.72**	**2.14**	**0.48**	**0**	
0-5	246,360	15,980	1,500	1,820	1,140	220	380	80	0	0	**0**	**20**	**0**	**0**	**0**	267,500
	2.68	0.17	0.02	0.02	0.01	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	2.91
	92.1	5.97	0.56	0.68	0.43	0.08	0.14	0.03	0	0	**0**	**0.01**	**0**	**0**	**0**	
	4.49	1.32	0.34	0.39	0.21	0.08	0.13	0.05	0	0	**0**	**0.07**	**0**	**0**	**0**	
5-10	298,300	32,800	4,780	3,460	1,960	440	440	160	40	0	**60**	**40**	**0**	**0**	**20**	342,500
	3.25	0.36	0.05	0.04	0.02	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	3.73
	87.09	9.58	1.4	1.01	0.57	0.13	0.13	0.05	0.01	0	**0.02**	**0.01**	**0**	**0**	**0.01**	
	5.44	2.72	1.09	0.73	0.35	0.16	0.16	0.1	0.04	0	**0.07**	**0.14**	**0**	**0**	**0.3**	
10-20	548,660	87,480	15,380	11,180	6,780	1,600	1,200	360	120	40	**60**	**60**	**80**	**20**	**60**	673,080
	5.98	0.95	0.17	0.12	0.07	0.02	0.01	0	0	0	**0**	**0**	**0**	**0**	**0**	7.33
	81.51	13	2.29	1.66	1.01	0.24	0.18	0.05	0.02	0.01	**0.01**	**0.01**	**0.01**	**0**	**0.01**	
	10	7.24	3.51	2.37	1.22	0.58	0.43	0.22	0.12	0.06	**0.07**	**0.22**	**0.86**	**0.48**	**0.91**	
20-50	1,157,000	269,120	67,860	54,980	40,820	10,600	6,940	1,980	600	220	**400**	**100**	**60**	**0**	**80**	1,610,760
	12.61	2.93	0.74	0.6	0.44	0.12	0.08	0.02	0.01	0	**0**	**0**	**0**	**0**	**0**	17.55
	71.83	16.71	4.21	3.41	2.53	0.66	0.43	0.12	0.04	0.01	**0.02**	**0.01**	**0**	**0**	**0**	
	21.08	22.28	15.47	11.66	7.36	3.85	2.46	1.21	0.62	0.35	**0.45**	**0.36**	**0.64**	**0**	**1.21**	
50-100	1,083,120	304,040	107,020	104,180	91,380	26,860	17,980	7,280	1,900	1,000	**1,520**	**280**	**20**	**40**	**20**	1,746,640
	11.8	3.31	1.17	1.14	1	0.29	0.2	0.08	0.02	0.01	**0.02**	**0**	**0**	**0**	**0**	19.03
	62.01	17.41	6.13	5.96	5.23	1.54	1.03	0.42	0.11	0.06	**0.09**	**0.02**	**0**	**0**	**0**	
	19.73	25.17	24.4	22.09	16.48	9.77	6.38	4.43	1.96	1.61	**1.71**	**1.01**	**0.21**	**0.96**	**0.3**	
100-250	1,131,060	360,920	165,820	186,960	225,380	94,380	72,600	36,280	18,320	8,980	**10,240**	**2,460**	**460**	**100**	**160**	2,314,120
	12.32	3.93	1.81	2.04	2.46	1.03	0.79	0.4	0.2	0.1	**0.11**	**0.03**	**0.01**	**0**	**0**	25.21
	48.88	15.6	7.17	8.08	9.74	4.08	3.14	1.57	0.79	0.39	**0.44**	**0.11**	**0.02**	**0**	**0.01**	
	20.61	29.88	37.81	39.64	40.66	34.32	25.76	22.08	18.95	14.42	**11.5**	**8.85**	**4.93**	**2.39**	**2.42**	
250-500	347,220	110,680	59,320	82,040	130,120	87,920	96,680	51,500	35,980	**26,620**	**29,340**	**6,920**	**1,640**	**340**	**440**	1,066,760
	3.78	1.21	0.65	0.89	1.42	0.96	1.05	0.56	0.39	**0.29**	**0.32**	**0.08**	**0.02**	**0**	**0**	11.62
	32.55	10.38	5.56	7.69	12.2	8.24	9.06	4.83	3.37	**2.5**	**2.75**	**0.65**	**0.15**	**0.03**	**0.04**	
	6.33	9.16	13.52	17.39	23.47	31.97	34.3	31.35	37.21	**42.74**	**32.96**	**24.89**	**17.56**	**8.13**	**6.65**	
500-750	61,140	18,300	11,440	17,960	35,600	29,240	43,940	28,680	**16,600**	**10,760**	**17,620**	**5,560**	**1,420**	**1,100**	**820**	300,180
	0.67	0.2	0.12	0.2	0.39	0.32	0.48	0.31	**0.18**	**0.12**	**0.19**	**0.06**	**0.02**	**0.01**	**0.01**	3.27
	20.37	6.1	3.81	5.98	11.86	9.74	14.64	9.55	**5.53**	**3.58**	**5.87**	**1.85**	**0.47**	**0.37**	**0.27**	
	1.11	1.52	2.61	3.81	6.42	10.63	15.59	17.46	**17.17**	**17.28**	**19.79**	**20**	**15.2**	**26.32**	**12.39**	
750-1000	13,500	4,540	3,040	5,220	12,220	12,800	20,220	**16,540**	**9,220**	**5,940**	**10,560**	**4,400**	**1,520**	**660**	**860**	121,240
	0.15	0.05	0.03	0.06	0.13	0.14	0.22	**0.18**	**0.1**	**0.06**	**0.12**	**0.05**	**0.02**	**0.01**	**0.01**	1.32
	11.13	3.74	2.51	4.31	10.08	10.56	16.68	**13.64**	**7.6**	**4.9**	**8.71**	**3.63**	**1.25**	**0.54**	**0.71**	
	0.25	0.38	0.69	1.11	2.2	4.65	7.17	**10.07**	**9.53**	**9.54**	**11.86**	**15.83**	**16.27**	**15.79**	**12.99**	
1000-2000	7,480	2,380	1,760	3,200	7,720	9,680	19,000	17,940	11,080	7,020	14,140	6,140	2,800	1,240	2,480	114,060
	0.08	0.03	0.02	0.03	0.08	0.11	0.21	0.2	0.12	0.08	0.15	0.07	0.03	0.01	0.03	1.24
	6.56	2.09	1.54	2.81	6.77	8.49	16.66	15.73	9.71	6.15	12.4	5.38	2.45	1.09	2.17	
	0.14	0.2	0.4	0.68	1.39	3.52	6.74	10.92	11.46	11.27	15.88	22.09	29.98	29.67	37.46	
2000-3000	780	160	220	140	600	580	1,840	2,160	1,960	1,080	3,040	960	720	520	1,160	15,920
	0.01	0	0	0	0.01	0.01	0.02	0.02	0.02	0.01	0.03	0.01	0.01	0.01	0.01	0.17
	4.9	1.01	1.38	0.88	3.77	3.64	11.56	13.57	12.31	6.78	19.1	6.03	4.52	3.27	7.29	
	0.01	0.01	0.05	0.03	0.11	0.21	0.65	1.31	2.03	1.73	3.41	3.45	7.71	12.44	17.52	
3000-4000	380	60	20	40	100	220	300	800	420	260	560	280	180	100	400	4,120
	0	0	0	0	0	0	0	0.01	0	0	0.01	0	0	0	0	0.04
	9.22	1.46	0.49	0.97	2.43	5.34	7.28	19.42	10.19	6.31	13.59	6.8	4.37	2.43	9.71	
	0.01	0	0	0.01	0.02	0.08	0.11	0.49	0.43	0.42	0.63	1.01	1.93	2.39	6.04	
4000-5000	440	0	20	100	120	200	220	180	320	160	800	260	200	40	100	3,160
	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0.03
	13.92	0	0.63	3.16	3.8	6.33	6.96	5.7	10.13	5.06	25.32	8.23	6.33	1.27	3.16	
	0.01	0	0	0.02	0.02	0.07	0.08	0.11	0.33	0.26	0.9	0.94	2.14	0.96	1.51	
>5000	100	20	20	0	100	0	0	100	40	80	140	120	40	0	20	780
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01
	12.82	2.56	2.56	0	12.82	0	0	12.82	5.13	10.26	17.95	15.38	5.13	0	2.56	
	0	0	0	0	0.02	0	0	0.06	0.04	0.13	0.16	0.43	0.43	0	0.3	
Total	5,488,500	1,207,760	438,600	471,660	554,340	275,020	281,860	164,280	96,700	62,280	89,020	27,800	9,340	4,180	6,620	9,177,960
	59.8	13.16	4.78	5.14	6.04	3	3.07	1.79	1.05	0.68	0.97	0.3	0.1	0.05	0.07	100

Table 6b: Joint distribution of yearly supplements and co-payments : pessimistic scenario (i.e. without MaB)

		Supplements					
		0-100	**100-250**	**250-500**	**500-1000**	**>1000**	**Total**
Co-payments	**0-100**	5,192,420	27,060	8,120	0	0	5,227,600
		0	0	1,980	3,780	0	5,760
		0	0	0	360	3,900	4,260
	100-250	2,164,520	72,600	13,920	0	0	2,251,040
		0	0	22,360	20,840	0	43,200
		0	0	0	6,460	13,420	19,880
	250-500	787,540	41,440	0	0	0	828,980
		29,760	55,240	51,500	20,680	0	157,180
		0	0	0	41,920	38,680	80,600
	500-1000	0	0	0	0	0	0
		221,440	52,600	17,380	0	0	291,420
		3,560	11,560	27,840	42,520	44,520	130,000
	>1000	0	0	0	0	0	0
		0	0	0	0	0	0
		36,640	21,360	21,180	22,420	36,440	138,040
	total	8,144,480	141,100	22,040	0	0	8,307,620
		251,200	107,840	93,220	45,300	0	497,560
		40,200	32,920	49,020	113,680	136,960	372,780

2.2.2 Which groups are mainly concerned (table 7)?

It is to be expected that individuals with larger health care needs will also have to pay larger supplements (and co-payments). This expectation is confirmed by the following simple regressions (standard errors between brackets) where total 'official health care payments (sum of co-payments and health care reimbursements (ZIV)) are used as a proxy for health care needs[ww]:

total supplements = 12.30+0.03 (ZIV + co-payments) R^2=0.13
(0.70) (0.0001)

total co-payments = 93.89+ 0.04 (ZIV + co-payments) R^2=0.45
(0.39) (0.00008)

total OOP payments = 106.20+0,07 (ZIV + co-payments) R^2=0.30
(0.87) (0.0002)

The statistical information shows that the coefficients are very significant and that the relation between total "official" health care payments and supplements is precisely estimated. An increase in total health care payments with €100 leads to an increase in supplements of €3, and to an increase in co-payments of €4. The constant is much larger for the co-payments, however. Of course, one should not give too much weight to these simple regressions, which only show a (probably poor) linear approximation of a complicated nonlinear relationship. Note, however, that the proportion of the variance explained for the supplements is much smaller than for the co-payments. This is perhaps not surprising given the fact that co-payments are often expressed as a proportion of ZIV-reimbursements. It may also be partly due to the fact that the measurement error is larger for supplements. Finally, it most probably reflects a larger variation in supply-side practices (and own choices) with respect to supplements. We will come back to this point in later sections.

It is instructive to keep these simple findings in mind when looking at the more detailed regression results of Table 7. This table gives a rather complete idea about the

[ww] 'ZIV' refers to the total health care reimbursements.

distribution of the supplements over different subgroups of the population. A list of the explanatory variables is given in Appendix 3. As was mentioned already, we stay rather close to the administrative definitions that are also followed in the IMA-data. For the interpretation of the results, the following grouping of variables is helpful:

- the variable "preftreat" takes the value 1 for individuals with preferential treatment (see chapter 1). This variable plays a crucial role in any evaluation of the efficacy of the existing social protection measures. In fact, the various results with respect to this variable will be summarised in the last section of this chapter.
- we introduce dummy variables for the provinces. We also have experimented with the use of indicators at the level of districts. This did not lead to interesting additional insights and in some cases the number of observations became rather small. We have therefore included in the report only the results at the level of the provinces.
- we have opted to capture the effects of age and gender by a series of dummies (one for each period of five years). This flexible specification allows for a complex nonlinear relationship. Further decreasing the time span of the dummies would reduce the number of observations in some cells and undermine the statistical reliability of the estimates.
- the fact that a person died during the year is captured by the variables died_q1 to q4. The distinction between the four quarters is necessary to better approximate the time pattern of expenditures in the last months of life. Moreover, someone who died in the first quarter cannot have any expenditure in later quarters: this leads to a mechanical negative effect on expenditures, which has to be corrected for.
- we have several variables that refer to the social status of the individual. Moreover, the variable "self_empl" stands for self-employed who have the right to reimbursement of small risks in the compulsory system. This is a specific group of mainly handicapped and to a lesser extent low-income pensioned people. As mentioned before, all the other self-employed have been removed from the sample. The supplements they pay will be analysed separately in the last section of this chapter.
- employment status is captured by the variables "unemployed", "parttime" and "early_retired". In addition, the variable "ben_unempl" is an additional marker for the long term unemployed (who have received unemployment benefits for a period longer than one year and are older than 50 years).
- the variables "nursing_pay_B" till "lumpsum_thirdparty" and "subsidy_handic" indicate that the individual has the right to a lump sum for chronic illness (nursing_pay_B, nursing_pay_C and phys_E, see chapter 1) or for being handicapped[xx]. We consider these variables to be indicators of higher health care needs. A crucial variable in this respect is also "work_incap", indicating that the individual has been unable to work for at least one day in the relevant period. Such "primary incapacity" (primaire arbeidsongeschiktheid in Dutch, incapacité primaire in French) indicates an initial period of inability to work. After a year of "primary incapacity", individuals move to the category of the disabled (invalids), which is represented in our data by the variable "inval". A priori one can expect that this initial period of primary incapacity is a period with high health care expenditures.

[xx] We did not include separately the information on some other lump sums giving right to protection against payment of supplements (lump sum for incontinence material, lump sum for palliative treatment), because the number of relevant observations in our sample was very small.

- in addition to the variables for unemployment, weak socio-economic status is also represented by "res_lowY" (residents with low income) and "guarant_Y" (receiving an income allowance below and above the age of 60).

It will have become clear that there is much overlap between these various categories. To give two examples: the handicapped may appear in various categories and many of the weaker socio-economic groups also get preferential treatment. However, the analysis of the data has shown that the overlap is far from perfect and that each of the variables included gives some useful additional information. This is the basic reason why we have included them all. However, for a correct interpretation of the results it is necessary to keep this overlap in mind. More specific information on the share of individuals with and without preferential treatment in the different socio-economic categories is given in appendix 4.

The most important column of Table 7 is the third one, which gives the results for the supplements. The first column gives the results for total ZIV-reimbursements, the second column the results for total co-payments. To make the table better readable, we omitted most of the statistical information. The coefficients in bold are significantly different from zero.

Combining the information in the table makes it possible to calculate the means for all the relevant subgroups. The intercept in column 3 (€13.67) has to be interpreted as the average supplement to be paid by an individual with the following reference characteristics: he is a male member of the active population (PUG/TIP), between 30 and 35 years old, living in the province of Antwerpen and not characterized by any of the other indicators of morbidity and social vulnerability. Each individual coefficient then shows how the mean for the respective subgroup differs from that reference amount. To give some examples: individuals with preferential treatment pay on average €26.89 less, an individual with the reference characteristics but living in Brabant Wallon pays €26.81 more, a female PUG/TIP between 85 and 90 years old pays €107.25 more. Combination of various coefficients also makes it possible to predict the average supplements paid by any subgroup. The average supplements to be paid by a male patient between 85 and 90 years old, living in Hainaut and who has a right to preferential treatment and to the so-called Forfait B for the chronically ill will be €261.88 (= 131.87 – 19.11 – 26.89 + 176.01) larger than the average supplements to be paid by the reference group.

The results for the supplements in the third column can best be interpreted when looking at them in three ways:

Simply looking at the results in column 3 shows how the supplements are distributed over the different groups in the population.

As argued before, there is a strong positive correlation between ZIV-reimbursements and total supplements. This is also obvious when comparing the significant effects in the first and third columns of Table 7. There is a large degree of overlap. A more detailed comparison reveals, however, which groups are relatively (i.e. in comparison to their ZIV-expenditures) more and which groups are relatively less hit by the supplements. A non-significant effect suggests either that this group is relatively well protected in the present system (in the sense of not having to pay higher supplements than the reference person), or that the variation of supplements for that group is large and the number of observations too small to get a statistically reliable estimate.

It should be emphasized that the dependent variable in the first three columns includes many zeroes. This is especially true in the case of supplements. This does not in the least detract from the interpretation of the coefficients in terms of means of the different subgroups. However, even from a purely descriptive point of view, one should be cautious in interpreting the coefficients since a low mean may (with these very skewed distributions) hide the fact that some individuals pay large supplements. To complete the interpretation we have therefore added a fourth column in Table 7. This column gives the results of a regression in which we only include observations with a

positive (non-zero) value of the dependent variable. Comparing columns 3 and 4 then immediately allows some further interpretation.

Before looking at the results in more detail, it is useful to repeat the general methodological warning which we emphasized already before. The regression results in Table 7 should definitely not be given a causal interpretation. This would have required the specification of a more complete structural model, including a better treatment of the zero observations. Our results should be interpreted as purely descriptive: they give a synthetic overview of the distribution of the supplements over the population, which could not easily be obtained by other means. This is also the reason why the regressions only include personal characteristics of the patients and no information about health care consumption (e.g. number of nights in a hospital) or about provider characteristics. In some sense, our regression model can be seen as a kind of simple linear approximation of a reduced form, in which the effects of the different structural elements (related to choices by patients and providers) come together. We will propose some elements of a more refined structural form in the following sections.

Let us now point to some interesting findings in Table 7:

- while we do not want to focus on the statistical results, it still deserves emphasis that the fraction of the variance explained in columns 3 and 4 is very low. In fact, the statistical performance of the large model in Table 7 is weaker than the one of the extremely simple regressions with which we started this section. It is not surprising that the distribution of supplements is characterized by many individual idiosyncrasies and, as emphasized already a few times, there is probably a lot of measurement error, mainly in the data for ambulatory supplements. It is important, however, to keep this in mind.
- the age pattern of total reimbursements is exactly in line with what is usually found in the literature: it is U-shaped with larger expenditures for the young and the old, both for men and women and with a hump for women between 25 and 35, i.e. at the age of pregnancy. Co-payments and supplements follow the same pattern. For the supplements, the increase is relatively even larger for women between 25 and 35 (compare also to the co-payments): this is not surprising, as it most probably reflects the larger supplements paid for the stay in the maternity ward[yy]. Another interesting phenomenon occurs at higher ages: while there is a very strong increase in the reimbursements, the pattern is much flatter both for co-payments and supplements.
- it is well known that the last months of life go together with large health care costs. Even individuals who die in the first and second quarter of the year have larger reimbursements (although for them the expenditures only relate to a fraction of the year). Supplements also significantly increase in the last months of life.
- preferential treatment induces larger reimbursements and lower co-payments. This reflects two effects, which cannot be separated: a mechanical effect (a shift from co-payments to reimbursements) and a morbidity and/or moral hazard effect, leading to a larger health care consumption. It is striking that the negative effect dominates, also for the supplements: despite a possibly (probably?) larger health care consumption, the supplements paid by patients with preferential treatment are on average €26.89 lower or even €63.96 lower if we restrict the analysis to positive supplements. This will mainly be due to the protective measures in the regulation, but also partly to different behaviour by patients and providers. We will return to these effects later in this report. It has to be kept in mind, however, that this is only

[yy] We cannot distinguish explicitly in our data the effect of rooming-in, i.e. of parents staying with their children in the hospital. In principle, these costs should be reflected in the bill for the children. Our results then suggest that the rooming-in effect is not very strong.

the partial effect of preferential treatment, and that e.g. disabled, handicapped or chronically ill are disproportionally represented in this category.

- the disabled, the handicapped and those on primary incapacity have larger ZIV-reimbursements. They also have larger supplements, but the increase in supplements is perhaps somewhat smaller than could be expected a priori. The same is definitely true for the chronically ill (as indicated by nursing_pay_B, nursing_pay_C and phys_E) where there is a huge increase in reimbursements: again supplements increase significantly, but definitely not in proportion to the increase in reimbursements. Note that for these categories the coefficients in columns 3 and 4 are similar. This strongly suggests that (contrary to most of the other categories) almost everybody pays supplements. Most of these supplements will be in the ambulatory sector, however. This may explain why they are (relatively) lower. However, this also suggests that caution is needed with this interpretation, since our information about ambulatory supplements is not completely reliable.
- socio-economic indicators are captured by the variables for the residents at low income (res_lowY), for the long-term unemployed (variables unemployed, parttime, early_retired and ben_unempl), and for the individuals who are entitled to a guaranteed minimum income (variables guarant_Y). These have hardly any significant effect on reimbursements, nor on supplements. This strongly suggests that the financial effects of out-of-pocket payments are rather limited for these groups (some significant but small effects for co-payments are found for res_lowY and guarant_Y). In fact, they are to some extent protected by similar regulations as those holding for preferential treatment. Some caveats are in order, however. It is possible that the variables used are not sufficiently refined to capture adequately different degrees of social vulnerability. It is also possible that there may be some underconsumption by these groups. Since we have no reliable indicators of health care needs, we cannot draw any conclusions in this respect. More research with other datasets is needed before strong conclusions can be drawn about the nature of the relationship between socio-economic background and out-of-pocket payments.
- it is worthwhile to look at the pattern of regional effects. In these regressions they capture both regional variations in unobservable morbidity (i.e. morbidity differences not controlled for by the variables included) and regional variations in supply-side behaviour. The Flemish provinces are similar to Antwerpen, except for Limburg where supplements are lower. Brussels and Liège show a striking pattern: average supplements are similar to the situation in Antwerpen, but non-zero supplements (column 4) are significantly larger. This suggests that relatively fewer patients pay supplements, but those who have to pay, pay (much) larger amounts. A similar result is found for Brabant Wallon, although there also the average is larger. The results for Hainaut are also revealing: average supplements are lower, but when we restrict the analysis to the positive observations, the difference disappears. This suggests that fewer patients pay supplements, but there is no difference in the amount to be paid. We will return to these regional patterns in section 3. It will turn out that the relative importance of ambulatory and hospital supplements plays an important role in explaining them.

Table 7: Distribution of total supplements over the population

	reimbursements inclusive 0	co-payments inclusive 0	supplements inclusive 0	supplements exclusive 0
N	271,813	271,813	271,813	114,341
Mean	1,438.43	157.09	60.77	151.18
Adj R²	0.25	0.23	0.03	0.04
Intercept	**232.61**	**60.12**	13.67	33.18
preftreat	**393.84**	**-132.37**	**-26.89**	**-63.96**
Vl_Brab	-36.96	-5.39	-2.01	8.32
W_Vl	106.92	-1.18	-4.15	-16.35
O_Vl	55.68	2.84	-0.03	0.75
Limburg	2.47	-6.45	**-13.79**	**-29.32**
Brussels	6.80	**-7.61**	10.24	**114.09**
Brab_W	97.36	**12.64**	**26.81**	**91.58**
Hainaut	**155.82**	**19.16**	**-19.11**	0.54
Liège	**125.35**	**22.09**	1.46	**57.41**
Luxemb	8.15	9.31	-7.26	11.77
Namur	75.97	**15.83**	-8.88	12.06
M_0	**732.04**	**40.84**	12.28	13.47
M_1-4	**241.59**	**31.70**	12.32	7.40
M_5-9	124.00	5.51	0.57	-9.70
M_10-14	50.73	5.22	4.06	1.75
M_15-19	18.62	0.99	8.35	13.20
M_20-24	-48.99	-9.49	-0.32	0.14
M_25-29	-15.70	-6.74	0.67	4.78
M_35-39	60.75	6.10	1.43	6.79
M_40-44	61.18	**14.64**	6.40	20.55
M_45-49	**238.08**	**28.89**	12.84	34.98
M_50-54	**483.56**	**62.80**	**25.61**	**66.68**
M_55-59	**781.13**	**91.01**	**44.50**	**101.84**
M_60-64	**896.53**	**98.41**	**61.37**	**132.03**
M_65-69	**1,589.39**	**152.11**	**84.48**	**153.31**
M_70-74	**1,994.95**	**199.31**	**96.19**	**166.90**
M_75-79	**2,373.73**	**236.93**	**98.80**	**160.39**
M_80-84	**2,721.51**	**242.73**	**98.78**	**157.59**
M_85-89	**3,311.12**	**252.38**	**131.87**	**208.18**
M_90-94	**2,882.97**	**204.45**	67.75	102.89
M_95+	**3,871.04**	**201.25**	156.92	272.56

	reimbursements inclusive 0	co-payments inclusive 0	supplements inclusive 0	supplements exclusive 0
F_0	**513.40**	**25.48**	9.69	11.54
F_1-4	131.94	**18.09**	8.56	4.37
F_5-9	43.79	-5.06	-1.08	-12.73
F_10-14	45.05	2.07	6.50	8.47
F_15-19	119.61	**23.79**	14.23	24.93
F_20-24	126.89	**39.23**	21.09	39.96
F_25-29	**396.12**	**67.68**	**82.85**	**162.08**
F_30-34	**389.69**	**71.04**	**86.79**	**173.50**
F_35-39	**312.78**	**59.06**	**47.51**	**94.46**
F_40-44	**310.13**	**63.77**	**31.04**	**57.44**
F_45-49	**374.30**	**73.31**	**31.14**	**56.06**
F_50-54	**552.64**	**104.46**	**40.69**	**70.91**
F_55-59	**706.61**	**112.93**	**51.04**	**93.03**
F_60-64	**1,037.80**	**135.73**	**68.26**	**117.39**
F_65-69	**1,383.50**	**169.55**	**73.08**	**120.44**
F_70-74	**1,768.16**	**209.57**	**102.19**	**175.38**
F_75-79	**2,480.82**	**255.64**	**111.26**	**178.85**
F_80-84	**2,976.24**	**275.78**	**113.89**	**179.75**
F_85-89	**4,044.74**	**264.35**	**107.25**	**166.09**
F_90-94	**4,310.71**	**203.48**	**55.71**	**103.10**
F_95+	**5,963.65**	**190.33**	46.46	131.23
died_q1	132.89	**-109.26**	**75.71**	56.43
died_q2	**3,870.64**	**69.74**	**188.51**	**158.35**
died_q3	**7,240.61**	**225.74**	**245.14**	**219.64**
died_q4	**10,832.00**	**416.86**	348.79	**332.94**
res_not lowY	-204.06	**36.97**	-3.05	-22.78
res_lowY	**275.80**	**32.35**	4.40	6.86
inval_tit	**2,492.93**	**238.85**	**73.15**	**109.82**
inval_dep	21.08	**54.13**	5.32	9.74
handic_tit	85.24	**71.07**	**39.31**	**100.94**
handic_dep	-214.87	**61.28**	24.66	91.56
retired	**171.61**	**54.53**	13.75	**39.32**
widow	**493.79**	**68.99**	17.21	**50.10**
orphan	**1,905.94**	72.36	150.39	248.27
self_empl	-158.57	**-30.68**	11.49	2.08
unemployed	17.81	0.54	-8.98	-17.23
parttime	-189.42	-14.77	-21.73	-40.48

	reimbursements inclusive 0	co-payments inclusive 0	supplements inclusive 0	supplements exclusive 0
early_retired	75.67	15.43	16.82	36.55
nursing_pay_B	**8,102.95**	**350.45**	**176.01**	**184.58**
nursing_pay_C	**9,978.22**	**330.31**	**142.60**	**171.41**
phys_E	**4,331.96**	**328.14**	**102.66**	**110.03**
incr_child_ben	**3,199.96**	**69.48**	**78.28**	**183.33**
integr_handic	**2,036.10**	**155.30**	**51.30**	**93.31**
help_elderly	**4,661.59**	66.32	1.71	-18.75
help_thirdparty	594.93	-29.58	-8.23	-25.64
ben_invalidity	722.72	**-80.00**	-12.72	-20.00
lumpsum_thirdparty	1,072.65	-57.91	-94.75	-146.10
guarant_Y_-60	116.09	**40.66**	-0.23	10.01
guarant_Y_+60	-10.15	**-27.11**	-14.62	-19.13
subsidy_handic	**1,469.81**	**23.96**	9.59	15.31
ben_unempl	-19.65	-1.25	-13.19	-27.97
work_incap	**1,966.49**	**201.23**	**158.36**	**203.55**

For the labeling of the variables, see appendix 3.

2.2.3 Which groups are "extreme" payers?

It may be argued that the global picture of the means as sketched in Table 7 is not the most relevant one from a policy point of view. Probably we are more concerned about the right tail of the distributions given in Tables 4-6, i.e. about the individuals who have to bear themselves a disproportionately large financial burden as the result of getting ill. The best way to approach the social consequences of this financial burden would be to relate it to the income of the relevant individuals. However, we do not have income data at our disposal. We therefore use a second best-approach in which we specify (in a somewhat ad hoc-way) thresholds for the out-of-pocket payments and the supplements. We will say that an individual pays "high" supplements if the total amount she pays is more than €500. We talk about "extreme" supplements if these are larger than €1,000. The same terminology is also used to describe "high" and "extreme" co-payments and out-of-pocket payments. The relevant cells are indicated in yellow and in brown respectively in Tables 4-6. We also indicated in brown the cell with the patients who have to pay an amount of co-payments between €500 and €1,000 and an amount of supplements in the same range, since we can be sure that they have global out-of-pocket payments of more than €1,000 (and we indicated for analogous reasons in yellow the cell with co-payments and supplements between €250 and €500).

It is obvious that our choice of thresholds is to a large extent arbitrary and that the same financial amount of OOP payments may have very different economic consequences for individuals (or households) at different income levels. It is therefore dangerous to consider our groups of "high" and "extreme" payers automatically as groups at risk. On the other hand, having to pay a large amount of OOP payments is definitely a crucial factor threatening the financial accessibility of the health care sector.

In addition, the same financial amount may have very different consequences if it only has to be paid once, versus if it is a recurrent payment. We will come back to the persistence over time of supplements in section 2.6.2.

Let us focus on the "extreme" threshold of €1,000 and consider the results in Table 4, i.e. for the realistic scenario. As mentioned already before, 136,960 patients had to pay these extreme supplements. Only 68,000 patients had to pay extreme co-payments.

This is thanks to the MaB, as in our pessimistic scenario (Table 6) more than 138,000 individuals are in that case. Of course, if almost 70,000 patients have to pay co-payments of more than €1,000, this is not only a success story: it can also be seen as an indication that the protection offered by the MaB is still far from perfect, e.g. because not all co-payments are included[zz]. We cannot make any strong statements in this respect, however, because of the limitations of our approximation procedure, leading e.g. to the neglect of the fiscal MaB. More focused research with more detailed data is necessary to get a more reliable picture of the effects of the MaB.

The most striking (and worrying) result in Table 4 follows if we add supplements and co-payments: in the realistic scenario at least 269,120 patients have out-of-pocket payments larger than €1,000. Table 4 immediately shows that for a large fraction of them, this is due to the supplements, i.e. there are many individuals who would not have reached the threshold of €1,000 with their co-payments but who do reach the threshold when the supplements are added. These are indicated in bold. In the following section we will show in more detail the categories of health care expenditures which move people into the category of extreme payers.

To get a better idea about the characteristics of these extreme payer groups we show in Table 8 the results of a logistic regression model in which the dependent variable is a discrete variable, taking the value 1 if the individual belongs to the group of extreme payers. The definition of extreme payer is different in the different columns. The first and second column of Table 8 give the characteristics of the individuals paying high and extreme supplements respectively, the third and the fourth (respectively the fifth and the sixth) show the characteristics of individuals with high and extreme out-of-pocket payments in the pessimistic (respectively realistic) scenario. Finally, the last two columns describe (for the pessimistic scenario) the characteristics of individuals who would not have reached the "large" or "extreme" threshold with their co-payments only, but who did reach the threshold because of their supplements. The explanatory variables are the same as in Table 7. The reference individual is also the same: he is a male member of the active population (PUG/TIP), between 30 and 35 years old, living in the province of Antwerpen and not characterized by any of the other indicators of morbidity and social vulnerability. Table 8 gives the odds effects, printed in bold if significantly different from 1. Odds effects are to be interpreted as an indication of the relative probability of belonging to the group of extreme payers[aaa]: if the number in the table is less than one, this means that the probability of being an extreme payer is smaller than for the reference group, and the opposite is true for an odds larger than one. Of course, most of the ratios in the table are larger than one, because the probability that our reference individual is an extreme payer is relatively low. Since almost all estimates are significant, we will base our interpretation also on their absolute values.

It is possible to get an indication of the relative probability of belonging to the group of extreme payers for subgroups defined by more than one variable. These relative probabilities are obtained by taking the product of the relevant odds effects.[bbb] For example, individuals with preferential treatment (preftreat) that experienced at least one day of work incapacity (work_incap) and that have otherwise the reference characteristics have an odds effect of 3.92 (=0.75*5.23) relative to individuals with the reference characterisics. Moreover, it is possible to get an idea of the relative probability of belonging to the group of extreme payers for a specific subgroup relative to another subgroup. For example, relative to individuals that live in Limburg and that have the reference characteristics, individuals with preferential treatment (preftreat) that experienced at least one day of work incapacity (work_incap) and that have the reference characteristics, experience an odds effect of 5.16 (=0.75*5.23/0.76).

[zz] On the other hand, there are some deficiencies in the MaB-system which may lead to "overprotection" (double reimbursements) when people have supplemental hospital insurance and at the same time qualify for the MaB. With our data, it is impossible to take into account this phenomenon. Moreover, recent changes in the regulation have made it less prominent.

[aaa] Formally, this is not fully correct. A more rigorous formulation would refer to "the relative increase in the probability to be an extreme payer if the variable changes from zero to one".

[bbb] Note that this is in contrast with the procedure for the average supplements paid by subgroups in the previous section (table 7) where we have summed the coefficients.

Looking at Table 8 immediately shows that the overall pattern of odds effects in the different columns is very similar. Moreover, the insights obtained in Table 8 are also in line with those derived from Table 7 – more specifically, we can almost perfectly compare the second column (extreme supplements) in Table 8 with the fourth column (non-zero supplements) in Table 7. We will therefore follow the same structure in our discussion:

- the age pattern is very similar. Higher morbidity, linked to higher age, increases the odds of becoming an extreme payer. Young children are relatively well protected – larger reimbursements and co-payments (see fourth column in table 7) are not reflected in larger supplements. This is probably partly linked to the much larger odds of becoming an extreme payer for women in the age categories between 25 and 40 years old. Age above 70 years is the single most important risk factor which raises the odds up to 10 and more.
- people have a large probability of becoming an extreme payer in the last year of their life, but the effect is perhaps a little less pronounced than what one might have predicted on the basis of Table 7.
- people with preferential treatment seem to be well protected, especially when we consider the overall effect on total out-of-pocket payments. Odds effects are about 0.4.
- the disabled and, even much more pronounced, those on primary incapacity have much larger odds effects. For the latter group this is not surprising, since one may expect a large concentration of health care costs in the period of primary incapacity.
- our hypothesis about the effects of economic vulnerability is not rejected by the findings in Table 8. Keeping constant all other variables (that is the whole idea of the regression), the unemployed and those that are entitled to a minimum income generally have a smaller probability of becoming extreme payers than our reference person[ccc]. We have mentioned some caveats in the previous subsection, but the results keep suggesting that economic vulnerability as such does not lead to higher health care costs. Of course, one should keep in mind that we have worked with a fixed absolute threshold: €1,000 may have a very different meaning for different individuals, depending on their overall economic situation.
- the pattern of regional effects does not suggest strong differentiation. Compare the odds effects for the province variables with those for some of the other personal characteristics. The danger of having to pay extreme supplements is higher in Brussels, Liège and Brabant Wallon, it is lower in Limburg, West- and Oost-Vlaanderen, Hainaut and Namur. When introducing the effect of co-payments (fourth and sixth column in Table 8), the regional differentiation becomes even more limited. There is a larger danger in Liège and Brabant Wallon, and mainly in the latter provinces supplements play an important role.

[ccc] Although there are some weak indications of a higher probability for the residents at low income (variable res_lowY).

Table 8: Characteristics of extreme payers: odds effects of logistic regression

	high supp	extreme supp	high OOP	extreme OOP	high MaB OOP	extreme MaB OOP	high through supp	extreme through supp
Vl_Brab	**0.91**	0.98	**0.93**	**0.95**	**0.94**	**0.94**	**0.94**	**0.93**
W_Vl	**0.97**	**0.8**	0.99	**0.97**	0.99	**0.96**	0.99	**0.89**
O_Vl	0.99	**0.91**	**1.06**	1.01	**1.06**	1	**1.06**	**0.94**
Limburg	**0.76**	**0.67**	**0.88**	**0.84**	**0.88**	**0.82**	**0.88**	**0.82**
Brussels	**0.91**	**1.25**	**0.9**	1.01	**0.88**	1	**0.9**	**0.92**
Brab_W	**1.07**	**1.56**	**1.15**	**1.21**	**1.14**	**1.17**	**1.15**	**1.17**
Hainaut	**0.65**	**0.64**	**1.03**	**0.88**	0.99	**0.82**	**1.03**	**0.67**
Liège	1.02	**1.23**	**1.17**	**1.15**	**1.13**	**1.12**	**1.17**	1.02
Luxemb	**0.89**	0.96	1.01	1	1	1.01	1.01	**0.92**
Namur	**0.79**	**0.86**	**1.08**	**1.04**	**1.04**	1	**1.08**	**0.95**
M_0	1.02	**0.27**	**2.5**	**1.53**	**2.53**	**1.53**	**2.5**	1.26
M_1-4	1.11	1.01	**1.51**	0.9	**1.54**	1.03	**1.51**	**1.22**
M_5-9	**0.5**	**0.5**	**0.8**	**0.36**	**0.8**	**0.4**	**0.8**	**0.5**
M_10-14	**0.75**	**0.5**	**0.79**	**0.48**	**0.79**	**0.55**	**0.79**	**0.6**
M_15-19	**1.12**	**0.81**	**0.81**	**0.81**	**0.81**	0.93	**0.81**	0.94
M_20-24	**0.87**	0.93	**0.84**	**0.81**	**0.81**	**0.88**	**0.84**	0.88
M_25-29	**1.18**	**1.2**	**1.08**	**1.21**	1.06	**1.18**	**1.08**	**1.34**
M_35-39	**1.2**	**1.5**	**1.2**	**1.28**	**1.19**	**1.32**	**1.2**	**1.35**
M_40-44	**1.55**	**1.79**	**1.4**	**1.69**	**1.4**	**1.87**	**1.4**	**1.89**
M_45-49	**1.94**	**2.28**	**1.79**	**2.09**	**1.8**	**2.37**	**1.79**	**2.39**
M_50-54	**2.57**	**2.97**	**2.81**	**2.88**	**2.87**	**3.2**	**2.81**	**3.08**
M_55-59	**3.42**	**4.7**	**3.61**	**4.02**	**3.67**	**4.7**	**3.61**	**4.34**
M_60-64	**4.19**	**5.57**	**4.37**	**4.57**	**4.48**	**5.31**	**4.37**	**6.13**
M_65-69	**5.8**	**8.46**	**6.59**	**6.64**	**6.57**	**7.23**	**6.59**	**8.21**
M_70-74	**6.86**	**8.9**	**8.43**	**8.45**	**8.5**	**9.16**	**8.43**	**8.91**
M_75-79	**7.09**	**8.78**	**10.68**	**10.03**	**10.61**	**10.71**	**10.68**	**9.22**
M_80-84	**7.23**	**8.63**	**11.93**	**10.56**	**11.57**	**11.03**	**11.93**	**9.91**
M_85-89	**8.67**	**10.4**	**12.53**	**11.96**	**12.28**	**12.81**	**12.53**	**10.93**
M_90-94	**7.32**	**8.59**	**10.18**	**9.77**	**9.66**	**11.01**	**10.18**	**9.19**
M_95+	**6.68**	**13.41**	**9.38**	**9.23**	**8.78**	**9.53**	**9.38**	**8.23**
F_0	0.86	**0.58**	**1.81**	1.08	**1.87**	1.13	**1.81**	0.83
F_1-4	1	**0.81**	**1.24**	0.91	**1.26**	1.03	**1.24**	**1.22**
F_5-9	**0.33**	**0.22**	**0.56**	**0.28**	**0.58**	**0.26**	**0.56**	**0.32**
F_10-14	**0.84**	**0.7**	**0.76**	**0.48**	**0.76**	**0.56**	**0.76**	**0.67**
F_15-19	**1.66**	**1.52**	**1.3**	**1.25**	**1.34**	**1.44**	**1.3**	**1.66**
F_20-24	**2.96**	**2.31**	**1.95**	**2.08**	**2**	**2.3**	**1.95**	**3.01**
F_25-29	**10.1**	**8.89**	**5.37**	**7.56**	**5.52**	**8.92**	**5.37**	**12.11**
F_30-34	**9.95**	**9.34**	**5.26**	**7.48**	**5.4**	**8.79**	**5.26**	**11.5**
F_35-39	**4.75**	**5.92**	**3.27**	**4.26**	**3.32**	**4.84**	**3.27**	**6.29**
F_40-44	**3.08**	**3.55**	**2.79**	**2.83**	**2.84**	**3.19**	**2.79**	**3.59**
F_45-49	**3.08**	**3.86**	**3.07**	**2.79**	**3.08**	**3.2**	**3.07**	**3.49**
F_50-54	**3.48**	**4.7**	**4.07**	**3.93**	**4.14**	**4.49**	**4.07**	**4.8**
F_55-59	**4.21**	**5.98**	**4.35**	**4.54**	**4.46**	**5.26**	**4.35**	**5.9**
F_60-64	**4.9**	**6.77**	**5.62**	**5.33**	**5.64**	**6.08**	**5.62**	**6.75**
F_65-69	**5.37**	**6.83**	**6.86**	**6.33**	**6.88**	**7.11**	**6.86**	**7.15**
F_70-74	**6.73**	**8.72**	**9.04**	**8.43**	**9.03**	**9.18**	**9.04**	**8.66**

	high supp	extreme supp	high OOP	extreme OOP	high MaB OOP	extreme MaB OOP	high through supp	extreme through supp
F_75-79	**7.93**	**9.9**	**12.02**	**11.07**	**11.81**	**11.64**	**12.02**	**10.38**
F_80-84	**8.72**	**10.67**	**13.47**	**12.57**	**13.04**	**13.02**	**13.47**	**11.59**
F_85-89	**7.46**	**9.56**	**13.4**	**11.79**	**12.57**	**12.14**	**13.4**	**10.75**
F_90-94	**5.25**	**7.24**	**9.1**	**7.1**	**8.63**	**7.94**	**9.1**	**7.1**
F_95+	**4.39**	**4.25**	**8.36**	**6.44**	**7.52**	**6.49**	**8.36**	**5.97**
died_q1	**1.5**	**1.2**	0.93	1.07	1.04	**1.19**	0.93	**1.86**
died_q2	**3.17**	**2.38**	**2.56**	**2.75**	**2.84**	**2.93**	**2.56**	**3.42**
died_q3	**3.86**	**3.6**	**4.04**	**4.5**	**4.34**	**4.54**	**4.04**	**3.51**
died_q4	**5.13**	**4.95**	**6.52**	**7.15**	**6.84**	**6.89**	**6.52**	**3.86**
res_not lowY	**0.31**	**0.41**	**0.42**	**0.45**	**0.41**	**0.46**	**0.42**	**0.28**
res_lowY	0.96	**1.17**	**1.2**	**1.22**	**1.17**	**1.21**	**1.2**	**0.9**
inval_tit	**2.08**	**2.24**	**4.89**	**4.06**	**4.44**	**3.47**	**4.89**	**1.77**
inval_dep	**0.88**	**0.72**	**1.33**	**1.31**	**1.3**	**1.2**	**1.33**	**0.72**
handic_tit	**1.42**	**1.78**	**1.67**	**1.99**	**1.61**	**2.2**	**1.67**	**1.22**
handic_dep	**1.22**	**1.41**	**1.6**	**1.72**	**1.54**	**1.67**	**1.6**	**1.22**
retired	**1.19**	**1.28**	**1.6**	**1.65**	**1.56**	**1.61**	**1.6**	**1.11**
widow	**1.15**	**1.28**	**1.77**	**1.76**	**1.61**	**1.53**	**1.78**	1.05
orphan	**2.49**	**3.76**	**1.73**	**2.3**	**1.88**	**2.85**	**1.73**	**1.86**
self_empl	**1.18**	**1.31**	**0.91**	0.98	**0.93**	1.01	**0.91**	**1.23**
preftreat	**0.75**	**0.69**	**0.42**	**0.44**	**0.43**	**0.41**	**0.42**	**0.86**
unemployed	**0.73**	**0.74**	**0.9**	**0.82**	**0.88**	**0.76**	**0.9**	**0.72**
parttime	**0.64**	**0.45**	**0.61**	**0.48**	**0.61**	**0.44**	**0.61**	**0.49**
early_retired	**1.34**	**1.43**	**1.23**	**1.34**	**1.22**	**1.34**	**1.23**	**1.25**
nursing_pay_B	**2.44**	**2.56**	**3.65**	**3.72**	**3.31**	**3.31**	**3.65**	**1.78**
nursing_pay_C	**1.94**	**2.05**	**2.48**	**2.71**	**2.1**	**2.56**	**2.48**	1.13
phys_E	**1.92**	**1.8**	**5.05**	**3.48**	**4.08**	**3.14**	**5.05**	**1.5**
incr_child_ben	**5.77**	**9.51**	**4.82**	**8.41**	**5.12**	**8.45**	**4.82**	**7.08**
integr_handic	**1.49**	**1.79**	**2.08**	**2.28**	**2.01**	**2.39**	**2.08**	**1.3**
help_elderly	0.95	**0.91**	**1.41**	**1.2**	**1.34**	**1.16**	**1.41**	**0.89**
help_thirdparty	**0.72**	0.84	0.94	**0.61**	0.94	**0.57**	0.94	**0.59**
ben_invalidity	1.15	1.11	**0.66**	**0.87**	**0.69**	1.08	**0.66**	**1.34**
lumpsum_thirdparty	**0.48**	**0.46**	**0.76**	**0.69**	**0.61**	**0.59**	**0.76**	**0.68**
guarant_Y_-60	**0.57**	**0.61**	**1.18**	**0.82**	1.03	**0.65**	**1.18**	**0.53**
guarant_Y_+60	0.97	**0.82**	0.98	0.98	1.01	0.99	0.98	0.97
subsidy_handic	**1.23**	**1.2**	**1.38**	**1.23**	**1.24**	**0.94**	**1.38**	**1.41**
ben_unempl	**0.73**	**0.72**	**0.9**	**0.84**	**0.87**	**0.82**	**0.9**	**0.76**
work_incap	**5.23**	**5.77**	**7.13**	**6.46**	**7.02**	**6.18**	**7.13**	**5.22**

For the labeling of the variables, see appendix 3.

Key points

- **While the majority of people paid no supplements in 2003, about 137,000 persons paid more than €1,000. Large supplements are mainly related to hospital stays and often come on top of large co-payments.**
- **The traditional morbidity factors have a positive effect on average supplements to be paid and increase the chance of becoming extreme payers. Supplements are larger for the disabled, the handicapped, those on primary incapacity and the chronically ill.**
- **The age-pattern of supplements is U-shaped with a hump for women between 25 and 35 and with a significant increase in the last months of life.**
- **After controlling for the other confounding factors, supplements are on average smaller for individuals with preferential treatment and show no strong relationship with socio-economic background.**

2.3 A DISAGGREGATED APPROACH

In the previous subsection, we only looked at the total amount of supplements paid by different groups in society. We can obtain interesting additional insights by disaggregating total health care expenditures in a number of categories. The detailed description of the categories we used is given in the Technical note in Appendix 1.

In the first subsection, we will analyse these disaggregated data at the level of the individual patient. We will also focus on the extreme payers, as defined in the previous section.

Since hospital supplements are more important from a social point of view, and since the available data for inpatient supplements are much richer, we will describe these in more detail. More specifically, the database delivered by IMA does not only contain information at the level of the individual patient but also detailed information at the level of the individual hospital stays. In the second subsection we will give a first descriptive analysis of these data.

2.3.1 Disaggregated analysis at the level of the individual patient (tables 9, 10, 11 and 12)

Table 9a gives a first impression about the relative importance of the different categories of supplements. A concise description of the categories is given in Appendix 3 whereas Appendix 2 gives full details of the composition of the categories. Note that the suffix _a refers to ambulatory services, whereas _h refers to inpatient (hospital) services. Most names of categories speak for themselves, but three categories are worth mentioning. Physspec, includes all consultations of a general specialist, whereas Special_a includes services of internal medicine, neurology, psychiatry, neuropsychiatry, pediatrics and visits with increased fee. We distinguish the two categories because the average supplements paid differ. The variable Nursing day_h refers to room supplements.

The third column in Table 9a gives the average amount of supplements paid for the different categories, the fourth column gives the same number but only for the individuals with non-zero supplements for the specific category; columns 1 and 2 give the respective sample sizes[ddd]. The seventh column and eighth column show for both selections of observations the supplements as a percentage of the sum of ZIV-reimbursements and co-payments for the relevant category; the relevant sample sizes are in columns 5 and 6[eee]. Table 9b compares the average amounts of supplements, co-

[ddd] All numbers are unweighted.

[eee] The sample size in column six can be interpreted as the number of individuals with consumption for the respective categories. Note that the sample sizes for the non-zero percentage prices are in most cases smaller

payments and reimbursements and the relative importance of the different categories in the total. The results speak for themselves. Table 9a confirms the finding of Figure 2 that hospital supplements are much higher than ambulatory supplements. Although the averages for the population are small for all ambulatory categories, the picture is slightly different when we look at the separate ambulatory categories for individuals with positive supplements (means exclusive supp 0). Paramedical costs e.g. then become rather important: the 3,153 individuals paying paramedical supplements, pay on average €130. This amount equals 49.5% of paramedical ZIV-reimbursements plus co-payments. If we consider all individuals who consume paramedical care (those with positive paramedical ZIV-reimbursements+copayments), the percentage paramedical price is only 4.4%. This large difference between both percentages is due to the relatively large number of patients with paramedical consumption but with 0 supplements (compare N in columns 5 and 6). Not all paramedical professions charge supplements to the same degree, but due to the small number of observations, this could not further be analysed. For all ambulatory categories, the difference between columns 7 and 8 is large, meaning that only a small number of patients with positive consumption for the category, also have to pay supplements. As already mentioned, information with respect to ambulatory supplements has to be interpreted cautiously. There can be regional differences and differences between suppliers in the registration of these supplements.

Average hospital supplements are dominated by fee and by room supplements. For the total population average fee supplements are €20 and room supplements €12. As expected, means inclusive 0 and exclusive 0 are always very different because only a small fraction of the population is hospitalized. For those who have to pay them, implants may also cause large supplements. Of course, supplements for implants usually are not recurrent. In the same way, fee supplements are much less dependent on the length of stay than room supplements. Length of stay will therefore be an important factor in our further analyses.

Looking at the relative prices in columns 7 and 8, two striking results can further be observed. First, relative prices inclusive zero and exclusive zero are often not so divergent as in the ambulatory system, meaning that a much larger share of people with consumption also pay supplements. Second, for those who pay supplements, the relative price is high on average. Surgical supplements e.g. are about as high as ZIV-reimbursements + co-payments (97.6%); supplements of gynaecologists are 114% of ZIV-reimbursements + co-payments, material supplements for implants category 35bis 243%. However, for this last category the number of patients with positive supplements is small. As Table 9b shows, hospital supplements are relatively important compared to co-payments and reimbursements.

It is also useful to return to the problem of extreme payers as described in the previous subsection. Which categories of supplements lift patients above the threshold of "extreme" out-of-pocket payments? We bring together some results for the extreme payers in Tables 10a and 10b. Table 10a shows the results if we keep all observations in, Table 10b shows the means for the positive supplements of the category only. In each case we also show the results for the positive co-payments. Table 10 shows the same overall picture as Table 7, but some of the findings get stronger. For those who have to pay supplements on ambulatory paramedical care or who have to pay fee supplements in the hospital, these by themselves are on average large enough to pull them above the €500 threshold. Supplements are large for opticians (€253 and €219 respectively for high and extreme payers) and especially audiologists (€1,245 and €1,441 respectively for high and extreme payers). In both cases co-payments are rather low. Room supplements and implants also contribute strongly to individuals becoming extreme payers.

It is again very instructive to see how the supplements for the various categories are distributed over the population. Table 11 shows these results for the ambulatory supplements in a similar way as Table 7. Note, however, one important change compared to Table 7. Since there are now even more zero observations for the

than the sample sizes for the non-zero absolute prices because percentage prices could not be calculated in case of zeroes in the denominator (copay+ZIV).

supplements in the different categories, we only present the results for the positive observations. Again, one should be cautious in interpreting the results in Table 11, which now pertain to (sometimes rather small) subsamples of the population. The second row of Table 11 gives for each category the percentage of non-zero observations. This row is interesting in itself, because it gives a clear indication of the spread of various categories of supplements in the population. In our data, only 30% of the population are reported as having paid ambulatory supplements. It is immediately clear that for many of the categories the number of non-zero observations is very limited.

An interesting question relates to the interrelationship between hospital and ambulatory supplements. We emphasized that the hospital supplements are much larger on average and that, moreover, the ambulatory supplements are underestimated in the data. It is still useful to see whether patients paying large hospital supplements also have to pay large ambulatory supplements, i.e. whether hospital and ambulatory supplements are complements or substitutes. In the former case the personal costs of a stay in the hospital are even aggravated because on top of the hospital costs there are also ambulatory supplements to be paid. We have therefore included in the regressions for the ambulatory supplements an additional explanatory variable "having had at least one hospital stay during the year"[fff]. Note that this does not create a problem of "explaining expenditures by expenditures", because we only introduce this additional explanatory variable in the regressions for the ambulatory supplements. In fact, the results for the other coefficients hardly change through the introduction of this one.

Table 11 contains a huge, and therefore perhaps confusing, amount of numbers. Interpretation becomes easier, however, by comparing the results for the various subcategories with the overall results for supplements that are shown in the first column. The second column gives the estimation results for total ambulatory supplements, the other columns give the estimates for the detailed categories. The reference individual is the same as in the previous tables. Given the huge decrease in the number of observations, it is not surprising that the overall number of significant effects is smaller than in the previous estimations. A closer inspection nevertheless reveals some interesting patterns:

- there appears to be a significant effect of having been hospitalized on ambulatory supplements for specialist fees (physspec_a). This pattern makes sense and it shows that a stay in the hospital has also what could be called an "indirect" effect. This effect is large enough in absolute value (€7.13) not to be neglected.
- the significantly larger supplements paid by (both male and female) teenagers for dentistry (about €40) most probably reflect the use of orthodontic care. The relevant amounts are rather small, however.
- paramedical supplements (and to a much lesser extent supplements for physiotherapy) are very important for the elderly (up to more than €600 more than the reference individual). They also add to the financial burden of the disabled. Remember that in table 10 it was already suggested that in some cases they may become an important part of the financial burden of the extreme payers.
- patients in their last year of life have to pay on average large ambulatory supplements for drugs[ggg]. Large supplements on drugs have also to be paid by the chronically ill, who are entitled to lump sum C and by some other weaker groups (those who are entitled to increased child benefits or to an allowance for help to the elderly). The

[fff] An alternative would have been the introduction of the total amount of hospital supplements in the equations. However, as we will see, hospital supplements show a lot of interregional variation due to differences in hospital behaviour, and there may be a problem of spurious correlation with the ambulatory supplements. Moreover, the results using the total amount of hospital supplements are very similar to the results with the dummy.

[ggg] In fact, the large supplements are not caused by drugs as such (since supplements are not allowed) but by the other items in this category (see table 14 in the technical note in appendix 1).

chronically ill (entitled to lump sum C) on average also pay large supplements for clinical biology. The magnitude of the coefficients involved suggests that the personal costs of drugs for the chronically ill are not negligible. Moreover, since over-the-counter drugs are almost completely missing in our data set, these results certainly are an underestimate of the actual financial burden.

- primary incapacity leads to larger supplements to be paid for specialists and surgery. This suggests that there may also be a link with hospital stays. In the ambulatory sector, the negative effect of preferential treatment is hardly significant (except for specialist fees).
- there are some strong regional effects. For those who have to pay ambulatory supplements, they are higher in Brussels, Brabant Wallon and Liège. This effect is almost completely due to doctor fees.

Table 12 shows similar results for the various categories of hospital supplements. Of course, in this case it would not make sense to include the variable "having had at least one hospital stay during the year". Therefore, the first column is a copy of the fourth column in Table 7 and the second column gives the results for the total hospital supplements. One fifth of the population pays non-zero hospital supplements and the number of observations in the different columns is sometimes very small. This can again be seen in the second row of the table. The results have therefore to be interpreted with utmost caution. On the other hand, for those who have to pay, the average amounts point to a non-negligible burden. Given the relative importance of the hospital supplements, it is not surprising that they rather closely follow the overall pattern, as sketched in Table 7. Nevertheless, some points are worth noting:

- the age pattern for the total hospital supplements follows the usual shape (including the hump for women between 25 and 40 years old). The overall age pattern is also respected for many of the specific subcategories.
- the last year of life has a significant effect on hospital supplements. It is striking, however, that this does not show up in the doctor fees, but rather in drugs and in room supplements.
- there are some (not very strong) indications that the disabled and the handicapped pay larger supplements, but there is no clear pattern discernible for the different subcategories. The effects for the chronically ill (indicated by nursing_pay_B, nursing_pay_C and phys_E) are stronger. In addition to larger room supplements, we find here also a significant effect for drugs. This is perfectly coherent with the result we obtained for ambulatory supplements.
- as before, there are no significant effects for the weaker socioeconomic groups, except for an indication of positive effects on implants-article 35 for the temporarily unemployed and the early retired. Individuals who are entitled to preferential treatment pay lower supplements. This shows up both in the fee supplements and in the room supplements, but it is only significant in the latter.
- again, the regional effects are among the clearest. We see the usual suspects (Brussels, Brabant Wallon and Liège) showing up again. The effect is concentrated in fee and room supplements, but there is also a significant difference in the supplements for medicines.
- the number of significant effects differs a lot between the different columns and it is largest for fee and room supplements and for medicines. One should be cautious, however, not to draw too strong conclusions from this result. In fact, it may simply reflect differences in the potential variation which are due to our definition of the various subcategories. Since we have restricted the analysis in Table 12 to positive values of the dependent variable, one can a priori not expect

much variation in the case of implants, the more so since we have implemented a rather fine-grained distinction in this case. We only find significant effects in the case of implants that are not included in the nomenclature. There supplements are larger in the reference province (Antwerpen) than in any of the other provinces.

The results in this section are mainly descriptive. It would be dangerous to attach to them any causal interpretation. In later sections we try to go somewhat further in the direction of the specification of a more complete structural model. However, given the available data, the exercises we present should be seen as preliminary steps. For the hospital supplements, we will also use information at the level of the hospital stay. In the next subsection, we will first present these data.

Table 9a: Supplements for subcategories of expenditures: amounts per patient per year and percentages of co-payments plus reimbursements

	means (amounts in €)				% (supp/(copay + ZIV))			
	N total	N excl supp 0	incl supp 0	Excl supp 0	N incl supp 0	N excl supp 0	(Copay + ZIV)>0 incl supp 0	(Copay + ZIV)>0 excl supp 0
drugs_a	271,813	1,982	0.2	28.54	224,650	1,979	0.40%	39.50%
GP_a	271,813	40,630	0.78	5.72	221,993	40,622	0.90%	5.30%
special_a	271,813	26,717	1.34	14.54	149,251	26,701	1.40%	8.20%
physspec_a	271,813	28,836	0.95	9.29	141,914	28,796	3.10%	15.60%
surgery_a	271,813	13,656	1.37	30.04	80,703	13,648	3.20%	19.50%
physioth_a	271,813	3,552	0.51	43.47	35,556	3,530	0.90%	9.60%
paramedical_a	271,813	3,153	1.45	129.79	39,380	3,143	4.40%	49.50%
dental_a	271,813	20,340	1.17	14.87	109,955	20,335	1.60%	8.40%
clinical_a	271,813	2,844	0.02	2.13	141,143	2,844	0.10%	6.00%
other_a	271,813	17,880	1.03	16.07	120,796	17,711	1.50%	10.20%
medical fee_h	271,813	7,566	5.12	203.53	43,235	7,557	6.20%	34.70%
surgical fee_h	271,813	6,058	11.02	527.98	24,281	6,045	26.30%	97.60%
physio fee_h	271,813	215	0.04	53.58	11,858	214	1.20%	60.00%
gynaec fee_h	271,813	1,842	2.75	354.55	3,629	1,842	59.20%	113.90%
radio fee_h	271,813	5,278	1.02	60.40	35,628	5,256	3.10%	21.00%
clinical fee_h	271,813	1,903	0.26	40.30	36,006	1,899	1.60%	28.60%
Total fee supplements	*271,813*	*10,964*	*20.21*	*545.76*	*43,259*	*10,941*	*11.64%*	*44.37%*
drugs_h	271,813	32,273	4.66	45.52	36,449	32,268	47.00%	54.00%
impl28_h	271,813	3,909	2.41	207.51	5,921	3,892	86.40%	131.70%
impl35_h	271,813	3,268	1.49	185.68	5,285	3,267	56.10%	96.30%
impl35bis_h	271,813	456	0.17	130.02	6,068	456	18.20%	243.10%
implnon-reimb_h	271,813	3,291	1.76	158.40	0		.	
delivery impl_h	271,813	0	0	0.00	10,965		0.00%	
Total material supp	*271,813*	*9,460*	*5.83*	*207.84*	*12,687*	*7,728*	*70.26%*	*120.07%*
nursing day_h	271,813	17,288	12.18	218.34	55,462	17,274	3.50%	11.60%
divcost_h	271,813	44,262	8.24	55.35			.	.
paramedical_h	271,813	10,494	0.83	23.28	0		.	
other_h	271,813	181	0.03	46.03	3,699	180	3.50%	79.90%
Total	*271,813*	*114,341*	*60.79*	*151.18*	*257189*	*114330*	*2.50%*	*5.55%*

For the labeling of the variables, see appendix 3.

Table 9b: Supplements, co-payments and reimbursements for subcategories of expenditures

	supplements		co-payments		reimbursements	
	means	%of total	means	%of total	means	%of total
drugs_a	0.20	0.34	53.15	33.83	250.85	17.44
GP_a	0.78	1.29	18.69	11.90	80.68	5.61
special_a	1.34	2.21	9.87	6.28	77.32	5.37
physspec_a	0.95	1.56	10.06	6.41	20.32	1.41
surgery_a	1.37	2.25	0.74	0.47	19.08	1.33
physioth_a	0.51	0.84	10.54	6.71	34.03	2.37
paramedical_a	1.45	2.38	2.65	1.68	87.31	6.07
dental_a	1.17	1.93	8.82	5.61	48.06	3.34
clinical_a	0.02	0.04	7.61	4.84	42.71	2.97
other_a	1.03	1.69	4.71	3.00	235.86	16.40
medical fee_h	5.12	8.42	4.47	2.85	80.26	5.58
surgical fee_h	11.02	18.13	0.02	0.01	47.13	3.28
physio fee_h	0.04	0.06	1.24	0.79	3.72	0.26
gynaec fee_h	2.75	4.52	0.00	0.00	4.63	0.32
radio fee_h	1.02	1.67	0.79	0.50	26.78	1.86
drugs_h	4.66	7.66	1.43	0.91	49.31	3.43
impl28_h	2.41	3.97	0.14	0.09	9.85	0.69
impl35_h	1.49	2.45	0.23	0.15	16.33	1.14
impl35bis_h	0.17	0.28	0.89	0.57	5.39	0.37
implnon-reimb_h	1.76	2.90	0.00	0.00	0.00	0.00
delivery impl_h	0.00	0.00	2.37	1.51	0.00	0.00
nursing day_h	12.18	20.03	17.79	11.32	278.50	19.36
divcost_h	8.24	13.56	0.00	0.00	0.00	0.00
paramedical_h	0.83	1.36	0.00	0.00	0.00	0.00
clinical fee_h	0.26	0.43	0.85	0.54	15.30	1.06
other_h	0.03	0.05	0.06	0.04	5.08	0.35
Total	*60.79*	*100.00*	*157.13*	*100.00*	*1,438.50*	*100.00*

For the labeling of the variables, see appendix 3.

Table 10a: Supplements paid by high and extreme payers (inclusive zero consumption)

	high payers				extreme payers			
	N = 31,743				N = 13,676			
Category	**supp**	**% of tot supp**	**copay**	**% of tot copay**	**supp**	**% of tot supp**	**copay**	**% of tot copay**
drugs_a	1.38	2.53	182.45	42.05	2.43	3.12	185.04	38.69
GP_a	2.52	4.63	51.62	11.90	2.80	3.60	55.89	11.69
special_a	9.30	17.12	35.84	8.26	13.23	17.00	38.02	7.95
physspec_a	3.58	6.58	32.30	7.44	4.24	5.45	36.40	7.61
surgery_a	10.09	18.57	2.28	0.53	11.78	15.14	2.31	0.48
physioth_a	3.97	7.30	60.22	13.88	5.17	6.64	76.61	16.02
nursing_a	0.07	0.13	8.04	1.85	0.12	0.16	15.63	3.27
midwife_a	0.04	0.08	0.04	0.01	0.07	0.09	0.06	0.01
bandager_a	0.45	0.82	0.00	0.00	0.90	1.15	0.00	0.00
soles_a	0.27	0.49	0.30	0.07	0.24	0.30	0.26	0.05
orthoped_a	0.15	0.27	1.43	0.33	0.25	0.32	1.82	0.38
optician_a	0.65	1.19	0.02	0.00	0.35	0.45	0.01	0.00
audiol_a	10.63	19.55	0.74	0.17	23.09	29.67	1.18	0.25
logo_ortho_a	0.02	0.04	2.68	0.62	0.01	0.02	1.65	0.35
dental_a	5.85	10.76	14.37	3.31	5.11	6.56	12.39	2.59
clinical_a	0.12	0.22	23.77	5.48	0.22	0.28	27.69	5.79
other_a	5.28	9.71	17.83	4.11	7.83	10.06	23.26	4.86
Total_a	*54.36*	*100.00*	*433.94*	*100.00*	*77.84*	*100.00*	*478.23*	*100.00*
medical fee_h	52.83	10.45	37.17	13.81	111.83	11.21	62.46	13.26
surgical fee_h	114.99	22.76	0.20	0.08	241.48	24.21	0.42	0.09
physio fee_h	0.40	0.08	11.95	4.44	0.88	0.09	22.64	4.81
gynaec fee_h	28.76	5.69	0.02	0.01	52.57	5.27	0.03	0.01
radio fee_h	10.35	2.05	5.61	2.08	21.25	2.13	8.14	1.73
drugs_h	41.82	8.28	12.72	4.72	73.98	7.42	22.63	4.81
impl28_h	24.48	4.84	1.50	0.56	49.21	4.93	3.05	0.65
impl35_h	14.25	2.82	2.03	0.75	23.56	2.36	2.87	0.61
impl35bis_h	1.56	0.31	8.62	3.20	2.46	0.25	11.72	2.49
implnon-reimb_h	17.27	3.42	0.00	0.00	35.54	3.56	0.00	0.00
delivery impl_h	0.00	0.00	22.78	8.46	0.00	0.00	37.96	8.06
nursing day_h	121.78	24.10	159.83	59.37	245.50	24.61	288.72	61.30
divcost_h	67.33	13.32	0.00	0.00	121.75	12.20	0.00	0.00
paramedical_h	6.49	1.28	0.00	0.00	11.31	1.13	0.00	0.00
clinical fee_h	2.70	0.53	6.18	2.30	5.68	0.57	9.12	1.94
other_h	0.29	0.06	0.58	0.22	0.61	0.06	1.20	0.26
Total_h	*505.30*	*100.00*	*269.21*	*100.00*	*997.61*	*100.00*	*470.96*	*100.00*
Total	*559.65*		*703.15*		*1,075.45*		*949.19*	

For the labeling of the variables, see appendix 3.

Table 10b: Supplements paid by high and extreme payers (exclusive zero consumption)

	high payers				extreme payers			
Category	**N>0 supp**	**supp**	**N>0 copay**	**copay**	**N>0 supp**	**supp**	**N>0 copay**	**copay**
drugs_a	603	69.21	30,854	189.02	301	108.18	13,201	193.18
GP_a	8,289	10.16	29,920	55.31	3,664	11.22	12,753	60.65
special_a	6,699	43.85	23,711	46.89	2,994	60.82	10,376	49.26
physspec_a	6,479	16.89	25,736	39.07	2,919	19.19	11,309	43.18
surgery_a	3,707	86.90	10,537	7.17	1,566	105.78	4,342	7.72
physioth_a	1,646	77.40	12,227	159.69	798	90.96	6,096	177.84
nursing_a	43	60.10	2,270	124.29	21	79.45	1,262	189.23
midwife_a	28	32.48	48	17.46	18	36.57	29	20.26
bandager_a	124	130.26	0	0.00	81	168.81	0	0.00
soles_a	318	23.81	605	14.41	128	23.19	234	14.30
orthoped_a	80	52.83	860	47.46	36	92.38	421	53.80
optician_a	82	253.44	12	42.91	24	218.76	2	50.10
audiol_a	331	1,244.68	543	54.66	267	1,440.79	353	56.99
logo_ortho_a	17	29.91	301	244.48	5	36.82	130	179.88
dental_a	2,606	64.24	11,083	37.46	1,038	60.76	4,557	33.73
clinical_a	628	5.43	25,316	30.07	279	9.24	10,989	34.63
other_a	5,125	31.02	22,112	24.83	2,473	41.56	9,988	31.02
medical fee_h	6,618	231.88	19,964	57.15	4,847	295.24	11,012	76.33
surgical fee_h	5,696	558.34	24	238.99	4,358	671.34	17	289.96
physio fee_h	210	54.57	9,251	42.95	185	60.00	6,117	53.29
gynaec fee_h	1,784	363.28	6	82.67	1,237	412.36	3	92.30
radio fee_h	4,462	70.96	21,114	8.34	3,324	85.67	11,568	9.58
drugs_h	20,595	63.88	21,993	18.10	11,408	88.53	12,059	25.48
impl28_h	3,360	237.02	195	251.81	2,454	284.49	139	311.60
impl35_h	2,735	202.80	390	152.15	1,512	258.39	233	157.23
impl35bis_h	374	145.98	1,445	211.31	211	172.02	739	236.78
implnon-reimb_h	2,149	242.75	0	0.00	1,423	331.37	5,411	0.00
delivery impl_h	0	0.00	8,766	87.36	0	0.00	0	101.54
nursing day_h	13,205	278.27	21,964	227.87	8,376	385.51	12,044	325.50
divcost_h	20,167	103.93	0	0.00	10,731	153.44	0	0.00
paramedical_h	5,544	36.34	0	0.00	3,379	45.31	0	0.00
clinical fee_h	1,832	41.34	16,579	11.20	1,568	44.24	9,577	12.57
other_h	171	47.25	533	33.15	145	50.62	429	36.85

For the labeling of the variables, see appendix 3.

Table 11: The distribution of subcategories of ambulatory supplements over different subgroups of the population (exclusive zero consumption)

	Total supplements	Total_a	drugs_a	GP_a	special_a	physspec_a	surgery_a	physioth_a	paramedical_a	dental_a	clinical_a	other_a
Mean	151.18	30.40	28.54	5.72	14.54	9.29	30.04	43.47	129.79	14.87	2.13	16.07
% obs pos suppl	42.07	29.92	0.73	14.95	9.83	10.61	5.02	1.31	1.16	7.48	1.05	6.58
Intercept	-3.93	**12.87**	36.27	3.39	10.20	**8.39**	**39.77**	24.21	-4.25	5.64	1.41	7.68
Hospitalized	**389.27**	**10.12**	10.65	0.31	0.62	**7.13**	3.44	-3.18	-45.18	-0.56	0.86	**6.84**
Vl_Brab	19.40	5.26	-21.81	0.57	1.30	-0.60	6.95	-3.89	36.50	-0.66	-2.11	**8.38**
W_Vl	-12.45	-3.74	-14.20	-1.42	-4.62	**-1.18**	**-15.29**	4.51	19.42	-1.12	-0.87	1.44
O_Vl	2.25	0.88	-7.63	-1.73	-0.85	1.01	-4.63	-1.97	13.79	0.80	-1.31	2.25
Limburg	-23.30	-2.59	-1.18	0.05	-5.43	**-3.00**	-10.29	-2.27	81.79	1.98	-2.15	1.04
Brussels	**89.24**	**41.24**	-27.99	**6.00**	**55.33**	**5.39**	**105.60**	-9.76	23.80	5.50	5.33	**15.72**
Brab_W	**84.92**	**18.92**	10.16	**5.03**	**15.10**	**3.63**	**55.83**	1.62	108.38	-1.67	9.94	5.07
Hainaut	**-49.43**	-2.71	-21.50	2.07	3.29	0.86	5.82	-6.25	7.75	1.19	-0.26	**28.96**
Liège	21.22	4.76	-18.02	**2.94**	**10.06**	1.13	**26.49**	-18.08	-13.21	-1.03	-0.34	6.84
Luxemb	-13.67	0.71	**152.67**	**4.68**	-4.41	0.19	-3.30	-12.19	-6.06	4.37	1.13	**29.06**
Namur	-15.51	2.93	-19.42	2.44	5.94	**2.47**	1.32	15.57	131.68	-5.70	-0.47	6.18
M_0	**-188.00**	-10.78	-13.02	-0.08	-6.08	-4.08	-19.68	-14.06	0.00	0.00	-3.52	-9.46
M_1-4	**-59.96**	2.52	-17.19	0.28	-5.24	-3.29	8.10	5.24	37.89	-4.72	-0.38	-5.56
M_5-9	-14.54	2.07	-15.85	-1.13	-4.25	-3.21	-8.47	2.46	10.40	-1.24	0.67	-3.93
M_10-14	4.15	**18.39**	-17.37	-0.76	1.50	-2.51	-28.10	26.15	16.94	**42.53**	-22.54	0.48
M_15-19	11.39	3.90	-20.26	-0.64	3.82	-2.02	-21.90	15.54	-3.81	**14.26**	0.93	-3.53
M_20-24	1.03	4.45	-17.30	0.17	8.82	-0.57	6.56	-3.00	16.94	0.52	1.21	-0.89
M_25-29	6.29	0.21	-22.35	4.42	-0.54	-1.71	-18.62	4.70	6.16	0.47	6.32	-0.88
M_35-39	0.03	0.68	-12.14	0.41	-3.70	-1.85	-16.72	11.51	50.44	0.76	0.37	0.36

	Total supplements	Total_a	drugs_a	GP_a	special_a	physspec_a	surgery_a	physioth_a	paramedical_a	dental_a	clinical_a	other_a
M_40-44	7.73	0.74	-22.92	0.55	-1.90	-1.00	-21.35	23.81	11.24	0.89	2.95	0.24
M_45-49	15.88	8.37	-14.54	1.26	0.67	-1.91	-7.69	5.79	113.17	1.34	1.86	2.34
M_50-54	34.57	9.48	-15.37	2.64	-1.60	-2.16	-17.10	5.60	53.74	11.33	-0.20	0.14
M_55-59	**69.44**	10.83	-10.31	1.33	-0.76	-2.10	-15.89	9.21	91.82	11.88	-3.26	0.75
M_60-64	**91.68**	13.10	-13.35	2.14	2.16	-3.48	-17.61	25.72	140.82	12.14	14.25	0.01
M_65-69	**96.56**	14.89	-7.04	2.37	6.06	-2.27	-28.71	5.97	242.68	5.09	0.19	0.11
M_70-74	**100.17**	**20.86**	-32.18	3.09	3.08	-3.34	-26.43	14.50	**458.82**	6.91	3.42	-1.46
M_75-79	**79.42**	**26.31**	-33.79	2.42	7.16	-3.23	-30.00	9.92	**507.32**	11.79	-0.75	-2.95
M_80-84	66.73	**33.50**	34.94	1.51	16.41	**-4.61**	-23.60	25.53	**526.90**	3.97	2.15	-5.04
M_85-89	**109.79**	**36.25**	-140.23	1.80	26.93	-4.31	-22.42	41.62	**505.13**	4.64	-11.98	-13.19
M_90-94	33.41	**58.12**	-106.27	2.21	15.07	0.72	-37.01	**234.71**	455.56	-1.96	3.44	67.93
M_95+	145.27	52.34	-23.57	-0.24	1.16	4.16	-17.85	34.57	947.49	0.00	0.00	-51.24
F_0	**-175.80**	-11.01	-27.12	0.22	-8.31	-1.67	-42.34	-6.62	0.00	0.00	-3.06	-4.83
F_1-4	-56.08	-1.50	-21.21	0.04	-5.81	-3.63	15.27	3.15	14.71	-4.17	-1.24	-5.53
F_5-9	-13.96	2.21	-19.10	-0.09	-6.94	-3.19	-9.57	50.22	31.82	-2.48	0.49	-3.17
F_10-14	21.12	**19.50**	-18.23	-1.00	-2.88	-2.62	-25.16	-3.25	34.05	**41.36**	24.43	-3.90
F_15-19	7.54	**16.21**	-12.37	0.38	**20.48**	-1.24	-10.18	8.45	65.14	9.34	0.76	-2.59
F_20-24	7.31	2.08	27.79	0.41	0.93	-0.05	-27.35	22.22	32.76	-2.08	-0.34	-3.31
F_25-29	**79.27**	7.07	-19.48	1.44	-0.15	**4.38**	-13.61	4.85	39.35	-0.04	1.23	-2.16
F_30-34	**102.75**	7.98	-12.80	1.66	-0.39	**3.47**	1.85	2.19	14.68	2.19	-0.24	-2.64
F_35-39	**66.56**	7.28	-9.15	3.24	-0.65	1.52	-11.52	1.94	32.69	0.98	-0.13	-0.07
F_40-44	46.69	9.67	19.12	2.89	-0.95	0.90	-0.44	-2.73	36.76	1.13	-0.95	0.45
F_45-49	45.12	**15.16**	-13.12	3.05	0.06	0.49	-7.90	3.58	93.32	-0.07	-1.15	6.82
F_50-54	**59.87**	**17.23**	-13.71	3.23	0.75	0.11	-10.71	5.20	40.32	13.48	-1.14	4.53

	Total supplements	Total_a	drugs_a	GP_a	special_a	physspec_a	surgery_a	physioth_a	paramedical_a	dental_a	clinical_a	other_a
F_55-59	**77.55**	**16.72**	-2.58	4.21	0.85	1.36	-14.57	8.02	74.15	3.41	-1.47	4.07
F_60-64	**96.68**	**19.41**	9.83	3.68	1.86	0.09	-20.16	3.83	69.90	**22.05**	1.29	2.99
F_65-69	**87.89**	**19.71**	-6.43	4.31	5.78	-0.26	-24.48	12.43	97.86	10.44	2.13	2.36
F_70-74	**132.03**	**23.17**	-14.49	2.77	9.71	-0.75	-27.39	4.56	235.06	13.65	2.66	2.70
F_75-79	**117.53**	**29.48**	-4.77	2.81	11.54	-1.40	-27.62	28.94	**367.19**	9.23	-1.39	7.09
F_80-84	**107.09**	**34.31**	11.64	5.00	15.90	-2.29	-30.21	49.84	**427.46**	10.15	1.61	13.13
F_85-89	**86.53**	**41.52**	8.62	2.90	19.29	-3.37	-31.49	62.28	**635.28**	13.95	0.58	-1.09
F_90-94	48.13	18.14	-156.21	1.32	4.76	-4.60	-43.15	62.74	298.78	58.19	19.57	29.82
F_95+	38.69	15.25	-278.25	3.16	3.96	-4.25	-31.65	67.64	256.50	-5.21	23.33	37.85
died_q1	**-139.64**	-53.80	53.09	-4.58	-13.11	-9.59	-24.35	-29.68	0.00	0.00	0.00	-19.01
died_q2	-10.24	-25.49	**267.62**	-1.08	-5.15	-6.12	5.43	-72.15	-378.14	-19.90	**-88.41**	23.26
died_q3	64.89	-24.81	**229.53**	-0.17	-9.85	-5.19	-8.98	-44.32	-156.29	-13.39	0.15	-2.36
died_q4	**158.09**	4.74	**251.75**	0.45	-0.81	-3.44	-13.33	-22.21	-90.71	-12.38	**144.25**	11.97
res_not lowY	-80.16	-6.58	12.83	-0.71	-6.24	0.90	-32.69	12.55	38.42	-6.95	2.89	-1.85
res_lowY	-17.06	-0.09	2.05	-1.72	3.63	0.99	-3.21	-7.40	-11.38	2.67	2.33	14.08
inval_tit	20.07	9.09	-11.55	-0.65	3.16	1.51	-9.20	31.78	86.06	1.36	**11.05**	11.10
inval_dep	-20.93	-1.83	-4.68	0.08	-2.54	-0.24	13.32	-28.34	-13.97	7.87	-3.52	-0.83
handic_tit	**68.76**	12.39	-28.93	-0.43	10.64	0.88	0.77	-32.20	173.07	-8.52	-13.12	27.59
handic_dep	38.13	44.76	63.39	-0.26	-8.11	8.09	-6.00	**186.30**	**743.11**	-26.71	8.18	-3.08
retired	8.20	5.92	1.04	-0.38	3.80	0.65	1.81	16.30	14.35	6.21	-2.04	2.91
widow	12.87	6.94	-7.28	0.82	3.48	0.28	6.39	12.90	88.91	-1.76	1.14	0.23
orphan	249.72	-29.89	0.00	-3.73	-15.45	-5.92	-20.20	-58.36	-44.55	-21.66	7.81	-41.55
self_empl	20.46	9.15	46.85	-0.38	1.81	0.25	23.90	28.64	-69.22	15.91	**13.28**	-6.10
unemployed	**-35.44**	-2.54	17.76	-0.40	-2.84	-0.59	-8.33	10.92	41.52	-0.54	0.11	-1.45

	Total supplements	Total_a	drugs_a	GP_a	special_a	physspec_a	surgery_a	physioth_a	paramedical_a	dental_a	clinical_a	other_a
parttime	-33.94	-1.81	4.51	0.65	-5.97	-0.61	20.35	5.25	17.20	0.55	0.00	-1.03
early_retired	26.09	-4.52	-2.65	0.34	-2.13	0.61	-10.34	-21.43	-39.27	-2.93	-7.35	1.41
nursing_pay_B	**98.06**	-1.30	9.87	-0.05	-6.65	-2.91	-10.89	2.87	-41.29	-9.03	11.61	-16.91
nursing_pay_C	**133.52**	**46.54**	**333.22**	-0.47	-8.42	-0.72	-7.79	33.28	171.04	-19.94	**489.03**	-12.36
phys_E	**77.57**	9.72	-12.79	-0.87	0.15	1.96	0.27	-12.75	-50.22	-1.79	7.75	11.84
incr_child_ben	110.21	**101.62**	**156.18**	4.08	19.56	-0.23	2.36	68.12	278.01	33.10	**-252.53**	28.84
integr_handic	**77.27**	16.43	20.55	0.69	10.42	-3.44	-3.31	**57.51**	-103.39	26.29	-17.57	**63.79**
help_elderly	-36.49	1.53	262.25	0.99	-3.11	-1.15	3.73	-0.50	-224.11	13.92	-15.89	**43.40**
help_thirdparty	-2.88	2.16	-65.28	0.25	1.49	-1.50	0.26	4.49	-116.96	-18.58	16.56	**143.00**
ben_invalidity	-13.59	0.07	-4.02	1.12	1.34	1.03	-15.49	-63.96	182.68	-17.91	-13.48	-50.14
lumpsum_thirdparty	-165.03	-24.66	**-573.13**	-0.17	-2.24	-4.18	4.88	123.46	66.50	-23.18	0.00	-26.54
guarant_Y_-60	-68.70	3.33	-8.77	-1.23	2.63	2.64	76.38	-17.14	172.10	-3.84	-2.42	-14.42
guarant_Y_+60	-22.91	-7.26	-18.93	-0.79	-1.78	0.25	-2.49	11.78	-134.27	0.90	-10.89	1.00
subsidy_handic	-10.14	-3.92	46.94	1.18	-4.37	0.71	-7.65	8.36	59.13	-8.05	1.07	**-22.17**
ben_unempl	-30.33	-1.37	-7.75	-0.66	3.03	0.03	2.48	-0.83	-103.95	6.28	0.82	0.41
work_incap	**61.82**	**17.64**	1.18	1.18	3.82	**2.37**	**58.96**	0.20	9.86	-0.18	5.70	3.48
preftreat	**-83.32**	**-11.52**	0.02	-0.95	**-11.77**	-1.19	-7.93	2.15	-9.63	-0.01	-0.90	3.61

For the labeling of the variables, see appendix 3.

Table 12: The distribution of subcategories of hospital supplements over different subgroups of the population (exclusive zero consumption)

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28 _h	impl35_ h	impl35bis _h	implnon-reimb_h
Mean	*151.18*	*267.15*	*203.53*	*527.98*	*53.58*	*354.55*	*60.4*	*45.52*	*207.51*	*185.68*	*130.02*	*158.4*
% obs pos suppl	42.07	21.28	2.78	2.23	0.08	0.68	1.94	0.45	1.44	1.20	0.17	1.21
Intercept	33.18	**94.85**	132.16	**423.25**	62.74	120.05	32.46	11.31	160.45	102.38	74.29	**322.16**
Vl_Brab	8.32	24.07	14.10	16.71	10.75	34.44	-8.96	4.05	34.62	-2.87	52.60	**-164.06**
W_Vl	-16.35	8.63	-83.69	**-157.61**	-37.54	-47.55	**-34.46**	4.95	31.86	15.26	46.86	-86.60
O_Vl	0.75	2.64	-12.11	-78.05	-1.56	-35.58	-10.42	-0.71	25.20	5.78	44.95	**-141.18**
Limburg	**-29.32**	-15.00	-52.16	-62.32	19.21	-14.23	-21.60	-1.84	-12.76	3.68	13.66	**-126.38**
Brussels	**114.09**	**73.67**	**264.21**	**262.89**	-2.57	**139.90**	26.12	**19.56**	-12.81	-13.98	27.74	-129.13
Brab_W	**91.58**	**92.46**	244.03	**443.60**	7.10	**252.15**	10.75	12.68	48.50	-20.42	0.00	-165.71
Hainaut	0.54	-36.53	45.97	131.48	0.21	**82.93**	10.68	**10.22**	-25.18	-32.57	85.34	**-142.54**
Liège	**57.41**	**76.71**	-2.81	80.60	91.42	**124.49**	**37.62**	**10.67**	-24.19	-27.31	17.23	**-159.52**
Luxemb	11.77	40.57	51.00	83.75	-44.92	69.80	28.18	12.76	-44.32	11.33	-4.48	-109.71
Namur	12.06	-0.44	118.96	13.69	23.64	52.28	-5.73	8.77	-34.50	-55.78	19.47	-56.53
M_0	13.47	-26.54	-91.52	-443.83	0.00	0.00	0.79	21.17	-67.99	0.00	0.00	-182.85
M_1-4	7.4	-29.07	-16.37	-307.33	-34.32	0.00	-6.74	-2.66	61.60	0.00	9.54	-190.59
M_5-9	-9.7	-48.45	-43.63	-15.95	0.00	0.00	0.40	10.41	-134.94	0.00	0.00	-192.43
M_10-14	1.75	-52.43	-5.18	-123.64	0.00	0.00	10.88	-7.40	-65.68	24.20	-87.94	-172.34
M_15-19	13.2	10.56	167.83	-40.59	-49.47	0.00	7.44	-1.74	25.20	7.65	-101.51	-114.74
M_20-24	0.14	-11.25	-5.35	-72.92	83.19	0.00	0.85	3.76	-16.60	32.62	-76.73	-29.36
M_25-29	4.78	8.97	-36.67	48.61	-56.91	0.00	22.89	3.37	-11.34	147.19	16.66	-56.41

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28 _h	impl35_ h	impl35bis _h	implnon-reimb_h
M_35-39	6.79	12.59	-67.88	58.12	0.00	0.00	15.44	9.61	38.04	234.28	-7.12	-45.76
M_40-44	20.55	52.52	45.07	162.80	-17.98	0.00	24.38	5.57	57.65	**296.80**	34.67	-55.37
M_45-49	34.98	57.77	54.86	139.44	19.68	0.00	32.50	15.75	53.63	188.51	-1.83	-81.42
M_50-54	**66.68**	110.56	16.98	180.96	-39.29	0.00	**67.28**	13.22	-7.59	221.59	0.31	-105.09
M_55-59	**101.84**	**171.31**	75.95	**359.56**	-0.49	0.00	31.88	**24.34**	-16.66	**276.37**	19.63	-61.79
M_60-64	**132.03**	**214.61**	179.04	193.04	-57.01	0.00	59.25	16.54	-46.38	151.83	170.50	-96.90
M_65-69	**153.31**	**226.95**	33.59	297.66	-52.50	0.00	43.61	**27.42**	-32.96	153.82	-14.76	-111.11
M_70-74	**166.9**	**231.43**	55.61	184.36	-80.20	0.00	56.91	**26.91**	-47.70	137.92	55.94	-82.82
M_75-79	**160.39**	**194.57**	93.27	168.34	25.29	0.00	51.52	**26.90**	-25.77	98.88	49.59	-101.76
M_80-84	**157.59**	**179.67**	12.55	112.56	-86.71	0.00	70.99	19.58	-77.47	106.23	21.35	-156.82
M_85-89	**208.18**	**248.92**	117.09	72.08	-104.93	0.00	33.22	13.17	30.41	103.10	32.40	-9.10
M_90-94	102.89	119.29	-62.39	-336.38	-101.02	0.00	-3.06	-7.39	-32.75	125.85	0.92	-224.99
M_95+	272.56	308.78	307.93	-302.66	166.61	0.00	69.68	-9.94	0.00	0.00	0.00	0.00
F_0	11.54	-23.38	-63.90	-409.93	-28.52	0.00	2.37	18.59	-139.79	0.00	0.00	-172.68
F_1-4	4.37	-25.82	14.63	-206.09	0.00	0.00	3.55	-5.49	-90.82	0.00	0.00	-193.64
F_5-9	-12.73	-56.62	-38.44	-184.86	0.00	0.00	5.30	-0.73	-150.72	0.00	0.00	-178.56
F_10-14	8.47	-30.38	-67.30	27.76	0.00	-30.28	10.72	0.52	47.82	38.51	-43.94	-126.36
F_15-19	24.93	15.11	113.38	-36.21	-58.57	117.02	1.94	0.57	-20.16	72.90	-60.06	30.73
F_20-24	39.96	66.62	-54.74	-221.99	-53.13	150.02	4.92	10.57	-17.95	-35.63	128.09	140.88
F_25-29	**162.08**	**242.46**	-54.84	-229.73	-34.30	198.91	7.34	16.38	-24.50	-2.55	18.43	30.33
F_30-34	**173.5**	**269.80**	-59.89	-176.09	-43.68	215.10	7.51	15.48	25.67	75.78	-26.14	71.65
F_35-39	**94.46**	**167.47**	-34.09	-77.74	-42.68	211.68	14.14	10.59	157.60	-28.66	-38.60	114.37

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28 _h	impl35_ h	impl35bis _h	implnon-reimb_h
F_40-44	**57.44**	103.57	-5.67	8.45	0.00	187.58	28.47	11.58	45.31	-36.08	31.42	123.37
F_45-49	**56.06**	84.04	10.31	54.62	-33.07	225.63	22.03	12.95	157.54	74.45	-4.86	-53.00
F_50-54	**70.91**	103.60	-26.75	112.19	-12.28	215.39	41.19	15.50	35.97	51.22	38.92	-19.86
F_55-59	**93.03**	**149.06**	6.34	117.60	-39.68	257.24	48.26	13.14	14.59	123.24	8.00	-11.92
F_60-64	**117.39**	**196.16**	-3.42	96.71	-16.26	237.20	30.41	16.61	61.69	153.87	33.54	-133.43
F_65-69	**120.44**	**180.33**	25.23	68.12	-73.32	264.64	43.45	**24.15**	41.72	123.24	28.14	-94.41
F_70-74	**175.38**	**262.34**	219.19	168.44	38.94	264.64	35.58	21.92	55.84	137.51	32.94	-123.57
F_75-79	**178.85**	**239.11**	57.55	124.79	53.15	477.54	57.24	**26.00**	33.85	120.53	43.96	-104.01
F_80-84	**179.75**	**235.92**	8.98	-27.48	8.29	219.95	31.27	22.39	48.12	109.99	29.73	-143.04
F_85-89	**166.09**	**214.04**	94.39	-121.29	64.37	490.55	50.16	9.81	12.47	83.75	17.00	-182.39
F_90-94	**103.1**	164.82	168.70	-177.28	-83.89	0.00	37.41	-7.46	30.26	92.37	55.48	-218.95
F_95+	131.23	187.42	526.81	-64.04	0.45	0.00	45.67	-8.39	60.74	86.20	279.14	-145.38
died_q1	56.43	-34.43	469.23	-506.93	142.67	0.00	-0.06	20.71	-92.30	-65.19	-137.68	177.20
died_q2	**158.35**	86.57	52.35	-176.09	79.88	0.00	**56.89**	**53.91**	-69.05	-22.14	-74.76	15.54
died_q3	**219.64**	**160.42**	131.91	113.05	79.88	-38.10	42.70	**71.56**	-65.40	-45.02	-2.25	47.24
died_q4	**332.94**	**255.68**	142.18	50.93	-10.12	-267.52	40.32	**99.59**	-50.05	-40.68	-24.98	-0.73
res_not lowY	-22.78	-32.82	-68.00	-20.74	-42.35	-111.26	-27.33	1.35	17.19	0.00	0.00	-65.55
res_lowY	6.86	-3.19	-18.01	113.96	-6.49	-212.50	-18.57	6.39	80.96	-63.42	-11.79	74.31
inval_tit	**109.82**	**97.66**	53.06	29.18	6.59	-76.19	-0.60	**16.02**	71.97	-12.75	8.29	18.53
inval_dep	9.74	-8.25	-46.55	-6.00	0.00	-84.96	-15.45	-2.29	42.63	-7.93	67.88	20.04
handic_tit	**100.94**	**139.98**	198.48	28.10	0.00	241.33	-9.70	9.86	4.52	-10.14	29.64	-11.20
handic_dep	91.56	61.28	125.14	314.80	274.81	-67.32	-37.27	4.39	-127.70	-6.47	103.74	-3.23

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28 _h	impl35_ h	impl35bis _h	implnon-reimb_h
retired	**39.32**	42.96	50.21	116.16	55.52	-46.49	2.55	9.47	52.84	-41.36	14.62	44.92
widow	**50.1**	54.06	221.13	140.51	33.05	-138.30	14.19	9.23	53.57	-34.54	16.44	32.46
orphan	248.27	398.35	-101.64	0.00	0.00	0.00	-112.83	-40.65	31.78	-211.60	0.00	-56.26
self_empl	2.08	11.50	-41.19	80.56	-141.76	18.91	18.10	0.85	13.28	-23.59	-32.68	56.33
unemployed	-17.23	-47.87	15.92	24.12	-2.31	-32.69	-15.91	4.91	-13.06	29.51	-40.26	71.01
parttime	-40.48	-87.61	59.34	-1.38	-16.82	9.32	18.91	-6.84	-37.62	**516.27**	-48.14	-212.23
early_retired	36.55	95.34	-26.38	**389.94**	0.00	7.96	-18.04	11.28	98.21	**144.45**	-186.21	104.24
nursing_pay_B	**184.58**	**158.71**	-43.87	68.81	-153.32	325.53	-12.98	**35.03**	76.46	-23.01	19.49	-44.41
nursing_pay_C	**171.41**	157.58	19.01	-46.24	-105.34	0.00	-19.71	**36.64**	63.16	27.40	-92.76	-59.80
phys_E	**110.03**	**123.13**	148.56	71.30	178.96	-138.99	21.22	**18.47**	-6.16	18.34	-53.43	66.22
incr_child_ben	**183.33**	186.79	197.94	257.81	0.00	0.00	23.29	28.25	44.10	0.00	0.00	-37.86
integr_handic	**93.31**	112.50	-95.61	115.54	-78.15	75.92	30.47	10.49	-65.17	1.33	-80.34	52.37
help_elderly	-18.75	-40.03	-129.53	-32.92	264.08	0.00	-12.57	3.60	47.51	-5.09	-28.04	66.50
help_thirdparty	-25.64	-23.85	26.87	159.72	0.00	0.00	15.49	-15.59	12.47	-45.60	-244.93	-119.88
ben_invalidity	-20	16.94	-29.50	-148.14	0.00	609.23	-26.93	2.17	-31.37	218.79	222.83	25.58
lumpsum_thirdparty	-146.1	-159.71	63.00	-396.58	0.00	0.00	-76.45	-14.81	37.41	11.40	0.00	-270.40
guarant_Y_-60	10.01	-22.13	-101.85	176.58	-24.92	-13.54	-5.95	-3.30	-83.45	-48.24	36.55	77.46
guarant_Y_+60	-19.13	-33.69	-102.16	-108.05	121.71	-195.19	-11.90	2.18	3.46	25.60	2.35	-32.80
subsidy_handic	15.31	13.68	24.27	-50.70	-190.58	140.04	-14.06	7.17	-9.81	-16.82	28.97	14.83
ben_unempl	-27.97	-58.23	-49.60	-167.34	0.00	-9.03	25.12	-1.26	-41.79	-109.75	106.26	-108.75
work_incap	**203.55**	**167.93**	25.49	**115.65**	-6.61	0.65	4.78	**9.21**	29.28	62.26	22.39	29.07
preftreat	**-63.96**	**-96.25**	-45.39	-52.62	-74.50	-12.40	-3.15	2.50	-22.31	-0.22	-27.08	-23.46

Table 12 (continued): The distribution of subcategories of hospital supplements over different subgroups of the population (exclusive zero consumption)

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28_h	impl35_h	impl35bis_h	implnon-reimb_h
Mean	*151.18*	*267.15*	*203.53*	*527.98*	*53.58*	*354.55*	*60.4*	*45.52*	*207.51*	*185.68*	*130.02*	*158.4*
% obs pos suppl	42.07	21.28	2.78	2.23	0.08	0.68	1.94	0.45	1.44	1.20	0.17	1.21
Intercept	33.18	**94.85**	132.16	**423.25**	62.74	120.05	32.46	11.31	160.45	102.38	74.29	**322.16**
Vl_Brab	8.32	24.07	14.10	16.71	10.75	34.44	-8.96	4.05	34.62	-2.87	52.60	**-164.06**
W_Vl	-16.35	8.63	-83.69	**-157.61**	-37.54	-47.55	**-34.46**	4.95	31.86	15.26	46.86	-86.60
O_Vl	0.75	2.64	-12.11	-78.05	-1.56	-35.58	-10.42	-0.71	25.20	5.78	44.95	**-141.18**
Limburg	**-29.32**	-15.00	-52.16	-62.32	19.21	-14.23	-21.60	-1.84	-12.76	3.68	13.66	**-126.38**
Brussels	**114.09**	**73.67**	**264.21**	**262.89**	-2.57	**139.90**	26.12	**19.56**	-12.81	-13.98	27.74	-129.13
Brab_W	**91.58**	**92.46**	244.03	**443.60**	7.10	**252.15**	10.75	12.68	48.50	-20.42	0.00	-165.71
Hainaut	0.54	-36.53	45.97	131.48	0.21	**82.93**	10.68	**10.22**	-25.18	-32.57	85.34	**-142.54**
Liège	**57.41**	**76.71**	-2.81	80.60	91.42	**124.49**	**37.62**	**10.67**	-24.19	-27.31	17.23	**-159.52**
Luxemb	11.77	40.57	51.00	83.75	-44.92	69.80	28.18	12.76	-44.32	11.33	-4.48	-109.71
Namur	12.06	-0.44	118.96	13.69	23.64	52.28	-5.73	8.77	-34.50	-55.78	19.47	-56.53
M_0	13.47	-26.54	-91.52	-443.83	0.00	0.00	0.79	21.17	-67.99	0.00	0.00	-182.85
M_1-4	7.4	-29.07	-16.37	-307.33	-34.32	0.00	-6.74	-2.66	61.60	0.00	9.54	-190.59
M_5-9	-9.7	-48.45	-43.63	-15.95	0.00	0.00	0.40	10.41	-134.94	0.00	0.00	-192.43
M_10-14	1.75	-52.43	-5.18	-123.64	0.00	0.00	10.88	-7.40	-65.68	24.20	-87.94	-172.34
M_15-19	13.2	10.56	167.83	-40.59	-49.47	0.00	7.44	-1.74	25.20	7.65	-101.51	-114.74
M_20-24	0.14	-11.25	-5.35	-72.92	83.19	0.00	0.85	3.76	-16.60	32.62	-76.73	-29.36
M_25-29	4.78	8.97	-36.67	48.61	-56.91	0.00	22.89	3.37	-11.34	147.19	16.66	-56.41

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28_h	impl35_h	impl35bis_h	implnon-reimb_h
M_35-39	6.79	12.59	-67.88	58.12	0.00	0.00	15.44	9.61	38.04	234.28	-7.12	-45.76
M_40-44	20.55	52.52	45.07	162.80	-17.98	0.00	24.38	5.57	57.65	**296.80**	34.67	-55.37
M_45-49	34.98	57.77	54.86	139.44	19.68	0.00	32.50	15.75	53.63	188.51	-1.83	-81.42
M_50-54	**66.68**	110.56	16.98	180.96	-39.29	0.00	**67.28**	13.22	-7.59	221.59	0.31	-105.09
M_55-59	**101.84**	**171.31**	75.95	**359.56**	-0.49	0.00	31.88	**24.34**	-16.66	**276.37**	19.63	-61.79
M_60-64	**132.03**	**214.61**	179.04	193.04	-57.01	0.00	59.25	16.54	-46.38	151.83	170.50	-96.90
M_65-69	**153.31**	**226.95**	33.59	297.66	-52.50	0.00	43.61	**27.42**	-32.96	153.82	-14.76	-111.11
M_70-74	**166.9**	**231.43**	55.61	184.36	-80.20	0.00	56.91	**26.91**	-47.70	137.92	55.94	-82.82
M_75-79	**160.39**	**194.57**	93.27	168.34	25.29	0.00	51.52	**26.90**	-25.77	98.88	49.59	-101.76
M_80-84	**157.59**	**179.67**	12.55	112.56	-86.71	0.00	70.99	19.58	-77.47	106.23	21.35	-156.82
M_85-89	**208.18**	**248.92**	117.09	72.08	-104.93	0.00	33.22	13.17	30.41	103.10	32.40	-9.10
M_90-94	102.89	119.29	-62.39	-336.38	-101.02	0.00	-3.06	-7.39	-32.75	125.85	0.92	-224.99
M_95+	272.56	308.78	307.93	-302.66	166.61	0.00	69.68	-9.94	0.00	0.00	0.00	0.00
F_0	11.54	-23.38	-63.90	-409.93	-28.52	0.00	2.37	18.59	-139.79	0.00	0.00	-172.68
F_1-4	4.37	-25.82	14.63	-206.09	0.00	0.00	3.55	-5.49	-90.82	0.00	0.00	-193.64
F_5-9	-12.73	-56.62	-38.44	-184.86	0.00	0.00	5.30	-0.73	-150.72	0.00	0.00	-178.56
F_10-14	8.47	-30.38	-67.30	27.76	0.00	-30.28	10.72	0.52	47.82	38.51	-43.94	-126.36
F_15-19	24.93	15.11	113.38	-36.21	-58.57	117.02	1.94	0.57	-20.16	72.90	-60.06	30.73
F_20-24	39.96	66.62	-54.74	-221.99	-53.13	150.02	4.92	10.57	-17.95	-35.63	128.09	140.88
F_25-29	**162.08**	**242.46**	-54.84	-229.73	-34.30	198.91	7.34	16.38	-24.50	-2.55	18.43	30.33
F_30-34	**173.5**	**269.80**	-59.89	-176.09	-43.68	215.10	7.51	15.48	25.67	75.78	-26.14	71.65
F_35-39	**94.46**	**167.47**	-34.09	-77.74	-42.68	211.68	14.14	10.59	157.60	-28.66	-38.60	114.37

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28_h	impl35_h	impl35bis_h	implnon-reimb_h
F_40-44	**57.44**	103.57	-5.67	8.45	0.00	187.58	28.47	11.58	45.31	-36.08	31.42	123.37
F_45-49	**56.06**	84.04	10.31	54.62	-33.07	225.63	22.03	12.95	157.54	74.45	-4.86	-53.00
F_50-54	**70.91**	103.60	-26.75	112.19	-12.28	215.39	41.19	15.50	35.97	51.22	38.92	-19.86
F_55-59	**93.03**	**149.06**	6.34	117.60	-39.68	257.24	48.26	13.14	14.59	123.24	8.00	-11.92
F_60-64	**117.39**	**196.16**	-3.42	96.71	-16.26	237.20	30.41	16.61	61.69	153.87	33.54	-133.43
F_65-69	**120.44**	**180.33**	25.23	68.12	-73.32	264.64	43.45	**24.15**	41.72	123.24	28.14	-94.41
F_70-74	**175.38**	**262.34**	219.19	168.44	38.94	264.64	35.58	21.92	55.84	137.51	32.94	-123.57
F_75-79	**178.85**	**239.11**	57.55	124.79	53.15	477.54	57.24	**26.00**	33.85	120.53	43.96	-104.01
F_80-84	**179.75**	**235.92**	8.98	-27.48	8.29	219.95	31.27	22.39	48.12	109.99	29.73	-143.04
F_85-89	**166.09**	**214.04**	94.39	-121.29	64.37	490.55	50.16	9.81	12.47	83.75	17.00	-182.39
F_90-94	**103.1**	164.82	168.70	-177.28	-83.89	0.00	37.41	-7.46	30.26	92.37	55.48	-218.95
F_95+	131.23	187.42	526.81	-64.04	0.45	0.00	45.67	-8.39	60.74	86.20	279.14	-145.38
died_q1	56.43	-34.43	469.23	-506.93	142.67	0.00	-0.06	20.71	-92.30	-65.19	-137.68	177.20
died_q2	**158.35**	86.57	52.35	-176.09	79.88	0.00	**56.89**	**53.91**	-69.05	-22.14	-74.76	15.54
died_q3	**219.64**	**160.42**	131.91	113.05	79.88	-38.10	42.70	**71.56**	-65.40	-45.02	-2.25	47.24
died_q4	**332.94**	**255.68**	142.18	50.93	-10.12	-267.52	40.32	**99.59**	-50.05	-40.68	-24.98	-0.73
res_not lowY	-22.78	-32.82	-68.00	-20.74	-42.35	-111.26	-27.33	1.35	17.19	0.00	0.00	-65.55
res_lowY	6.86	-3.19	-18.01	113.96	-6.49	-212.50	-18.57	6.39	80.96	-63.42	-11.79	74.31
inval_tit	**109.82**	**97.66**	53.06	29.18	6.59	-76.19	-0.60	**16.02**	71.97	-12.75	8.29	18.53
inval_dep	9.74	-8.25	-46.55	-6.00	0.00	-84.96	-15.45	-2.29	42.63	-7.93	67.88	20.04
handic_tit	**100.94**	**139.98**	198.48	28.10	0.00	241.33	-9.70	9.86	4.52	-10.14	29.64	-11.20
handic_dep	91.56	61.28	125.14	314.80	274.81	-67.32	-37.27	4.39	-127.70	-6.47	103.74	-3.23

	Total supplements	Total_h	medical fee_h	surgical fee_h	physio fee_h	gynaec fee_h	radio fee_h	Drugs _h	impl28_h	impl35_h	impl35bis_h	implnon-reimb_h
retired	**39.32**	42.96	50.21	116.16	55.52	-46.49	2.55	9.47	52.84	-41.36	14.62	44.92
widow	**50.1**	54.06	221.13	140.51	33.05	-138.30	14.19	9.23	53.57	-34.54	16.44	32.46
orphan	248.27	398.35	-101.64	0.00	0.00	0.00	-112.83	-40.65	31.78	-211.60	0.00	-56.26
self_empl	2.08	11.50	-41.19	80.56	-141.76	18.91	18.10	0.85	13.28	-23.59	-32.68	56.33
unemployed	-17.23	-47.87	15.92	24.12	-2.31	-32.69	-15.91	4.91	-13.06	29.51	-40.26	71.01
parttime	-40.48	-87.61	59.34	-1.38	-16.82	9.32	18.91	-6.84	-37.62	**516.27**	-48.14	-212.23
early_retired	36.55	95.34	-26.38	**389.94**	0.00	7.96	-18.04	11.28	98.21	**144.45**	-186.21	104.24
nursing_pay_B	**184.58**	**158.71**	-43.87	68.81	-153.32	325.53	-12.98	**35.03**	76.46	-23.01	19.49	-44.41
nursing_pay_C	**171.41**	157.58	19.01	-46.24	-105.34	0.00	-19.71	**36.64**	63.16	27.40	-92.76	-59.80
phys_E	**110.03**	**123.13**	148.56	71.30	178.96	-138.99	21.22	**18.47**	-6.16	18.34	-53.43	66.22
incr_child_ben	**183.33**	186.79	197.94	257.81	0.00	0.00	23.29	28.25	44.10	0.00	0.00	-37.86
integr_handic	**93.31**	112.50	-95.61	115.54	-78.15	75.92	30.47	10.49	-65.17	1.33	-80.34	52.37
help_elderly	-18.75	-40.03	-129.53	-32.92	264.08	0.00	-12.57	3.60	47.51	-5.09	-28.04	66.50
help_thirdparty	-25.64	-23.85	26.87	159.72	0.00	0.00	15.49	-15.59	12.47	-45.60	-244.93	-119.88
ben_invalidity	-20	16.94	-29.50	-148.14	0.00	609.23	-26.93	2.17	-31.37	218.79	222.83	25.58
lumpsum_thirdparty	-146.1	-159.71	63.00	-396.58	0.00	0.00	-76.45	-14.81	37.41	11.40	0.00	-270.40
guarant_Y_-60	10.01	-22.13	-101.85	176.58	-24.92	-13.54	-5.95	-3.30	-83.45	-48.24	36.55	77.46
guarant_Y_+60	-19.13	-33.69	-102.16	-108.05	121.71	-195.19	-11.90	2.18	3.46	25.60	2.35	-32.80
subsidy_handic	15.31	13.68	24.27	-50.70	-190.58	140.04	-14.06	7.17	-9.81	-16.82	28.97	14.83
ben_unempl	-27.97	-58.23	-49.60	-167.34	0.00	-9.03	25.12	-1.26	-41.79	-109.75	106.26	-108.75
work_incap	**203.55**	**167.93**	25.49	**115.65**	-6.61	0.65	4.78	**9.21**	29.28	62.26	22.39	29.07
preftreat	**-63.96**	**-96.25**	-45.39	-52.62	-74.50	-12.40	-3.15	2.50	-22.31	-0.22	-27.08	-23.46

For the labeling of the variables, see appendix 3.

2.3.2 Disaggregated analysis at the level of hospital stay (tables 13, 14, 15 and 16)

For the analysis of hospital supplements, it is important to distinguish carefully between inpatient and day hospitalisations. We focus on inpatient hospitalisations. This makes our results directly comparable with those that have been presented in the recent study of the Union Nationale des Mutualités Socialistes[9]. Moreover, including day hospitalisations does not change the overall picture.

Table 13 gives a first overview of the supplements to be paid per hospital stay. The figures for the supplements are given in bold. To put the numbers in perspective we add the means per day and we also give the respective amounts of ZIV-reimbursements[hhh] and co-payments. These figures can be usefully contrasted with those given in Table 9, which were at the level of the individual patient. There are two important differences. First, since the data in Table 13 refer to hospital stays, they contain less zeroes than the overall average number given in Table 9. Second, however, one individual can have different stays in hospital during a year. In Table 13, these different stays are treated as different observations. For the construction of Table 9, they have been aggregated at the level of the individual. The data and the analysis in the previous subsection are therefore more relevant to describe the position of different individuals. The data in this subsection are more relevant to sketch a picture of the costs related to a stay in the hospital.

Table 13 shows that the average personal cost of one inpatient stay in a Belgian hospital amounts to €421 in 2003, of which €262 are supplements. Out-of-pocket payments are 13% of total payments. By far the most important categories are room and fee supplements. The former amounts to €70 for the whole stay (and has to be added to €101 of co-payments). The sum of al fee supplements is €112. Diverse costs, medicines and material (mainly implants), however, are not negligible either.

As described in the first chapter of this report, there are different regulations for supplements related to room type and to insurance status, i.e. whether patients have a preferential treatment or not. We therefore show in Table 14 the variations according to room type and to differences in insurance status. The results are striking. First, the differences according to room type are huge. As expected, supplements are highest in one person rooms "room_1p" (more than €800), followed by two-person rooms "room_2p" (more than €200) and common rooms "room_+2p" (about €70). Supplements are even smaller in rooms of unknown room type "room_un". These stays are not a random sample but are predominantly very short. At the same time, co-payments are rather similar for individuals in different room types but with the same insurance status[iii]. This suggests that there are no important differences in morbidity between the individuals in different room types. Second, the results for preferential treatment show a clear pattern. As expected, for each room type, co-payments are lower for patients with preferential treatment than for ordinary patients. The results for the supplements have to be interpreted cautiously. When we look at supplements per stay, there is, for each room type separately, hardly any difference between the supplements paid by patients, whether or not they have preferential treatment. At first sight, this may seem surprising given the differences in regulation. However, the apparent paradox disappears when we also consider the supplements paid per day (in the last but one column in Table 14). In fact, this column shows clear differences according to insurance status and these differences are relatively smaller than for co-payments. Of course, this implies that patients with preferential treatment on average have a longer length of stay. This hypothesis is corroborated by the information in Table 15.

[hhh] Due to the new system of hospital financing since July 1, 2002 the ZIV-reimbursement of an individual hospital stay is not available in the IMA-data. The amount for the ZIV-reimbursement of a hospital stay in table 13 is therefore an approximation. See the technical note in appendix 1 for more details.

[iii] Again, stays in an unknown room type, are an exception. Again, the much smaller co-payments are caused by the shorter length of the stays.

These results are informative as to the reasons for our previous finding that on average persons with preferential treatment pay less supplements than persons without preferential treatment. The cost per hospital stay is about the same whether patients have preferential treatment or not. This follows from the combination of a better protection but at the same time a longer length of stay for those with preferential treatment. Therefore the better protection is only a partial explanation for the differences in supplements paid. As Table 14 shows, differences in room choice also play a crucial role. Only 8% of the stays of persons with preferential treatment are in single rooms, whereas this amounts to 25% for those without preferential treatment. We will analyse room choices in more detail later in this chapter.

Table 16 shows some findings for the various subcategories, but differentiated according to room type and insurance status. The column 'mean' gives the average absolute amount of supplements, while the column '% of total' gives the share of this absolute amount in the total supplements per room type and preferential treatment status (final row in Table 16)[iii]. We again give the results, both per stay and per day. It is clear that for some categories (e.g. room supplements) it is most meaningful to look at the results per day. For other categories (e.g. implants) it is more reasonable to consider the results per stay. Table 16 clearly reflects the consequences of the protective measures for the weaker social groups, as is shown by a comparison with the regulation summarised in Table 3 of the previous chapter. As expected, differences between the supplements paid in different room types are large for room supplements and medical fee supplements, but less so for implants and certainly for drugs and paramedical materials. In fact, the remaining differences between room types for implants seem to suggest that there are behavioural differences which are not caused by the regulations. As a result the share of supplements of a specific category in total supplements varies according to room type. Moreover, although the total amount of supplements per stay in a certain room type is about the same for patients with or without preferential treatment, the composition is not. Fee supplements for surgeons and gynaecologists are most important for patients without preferential treatment staying in private rooms (42% of total supplements); room supplements are most important for patients with preferential treatment staying in private rooms (39% of total supplements and even 45% if diverse costs are included). This latter result is partly caused by the longer length of stay. Room supplements are also most important for patients staying in two-person rooms, while supplements for drugs are most important for patients staying in common rooms.

[iii] The totals given in Table 16 are not identical to the figures in Table 14 because negative expenditures were removed for each category separately in Table 16 (and only for the total sum in the calculation of the figures in Table 14).

Table 13: Reimbursement, supplements and co-payments per stay for inpatient hospitalisations

	REIMBURSEMENTS			SUPPLEMENTS			CO-PAYMENTS		
Category	mean per stay	mean per day	sum	mean per stay	mean per day	sum	mean per stay	mean per day	sum
medical fee_h	424.07	65.51	672,765,423	**28.29**	**5.35**	**44,881,249**	21.19	3.64	33,609,155
surgical fee_h	259.47	50.55	411,638,725	**62.51**	**14.46**	**99,172,651**	0.11	0.02	179,424
physio fee_h	21.39	1.35	33,933,344	**0.22**	**0.02**	**346,011**	7.14	0.51	11,319,861
gynaec fee_h	26.25	5.78	41,651,151	**15.75**	**3.30**	**24,992,047**	0.01	0.00	18,046
radio fee_h	120.85	26.48	191,722,035	**5.27**	**1.07**	**8,356,265**	2.71	0.88	4,295,323
drugs_h	256.58	29.28	407,041,251	**24.23**	**3.41**	**38,434,229**	8.03	0.70	12,733,457
impl28_h	53.89	7.65	85,493,372	**13.00**	**2.43**	**20,626,170**	0.77	0.10	1,213,946
impl35_h	85.18	18.99	135,125,445	**4.70**	**0.78**	**7,453,995**	0.87	0.34	1,381,349
impl35bis_h	24.97	6.83	39,607,388	**0.55**	**0.17**	**869,380**	2.38	0.77	3,780,146
implnon-reimb_h	0.00	0.00	0	**8.08**	**2.55**	**12,820,177**	0.00	0.00	0
delivery impl_h	0.00	0.00	0	**0.00**	**0.00**	**0**	11.48	2.49	18,210,847
nursing day_h	1,398.53	170.86	2,218,686,028	**69.64**	**9.02**	**110,480,163**	101.50	13.62	161,029,107
divcost_h	0.00	0.00	0	**25.45**	**4.56**	**40,368,069**	0.00	0.00	0
paramedical_h	0.00	0.00	0	**2.61**	**0.49**	**4,138,054**	0.00	0.00	0
clinical fee_h	63.97	12.78	101,491,652	**1.34**	**0.21**	**2,132,891**	2.95	0.98	4,681,725
other_h	27.47	2.81	43,583,550	**0.16**	**0.02**	**256,791**	0.33	0.02	527,106
Total_h	2,762.62	398.86	4,382,739,364	**261.80**	**47.82**	**415,328,140**	159.46	24.06	252,979,492

For the labeling of the variables, see appendix 3.

Table 14: Supplements and co-payments per inpatient stay, according to room type and preferential insurance status

room	pref treat	N	%room	Suppl per stay	Co-pay per stay	Suppl per day	Co-pay per day
room_1p	0	284,460	25.25	847.05	178.95	162.10	30.13
room_1p	1	35,940	7.82	898.88	153.86	110.79	10.03
room_2p	0	213,700	18.97	251.02	183.85	52.37	32.90
room_2p	1	89,640	19.50	236.80	104.63	26.42	10.72
room_+2p	0	570,820	50.66	70.88	176.34	15.56	30.41
room_+2p	1	305,660	66.49	79.15	133.22	9.26	9.04
room_un	0	57,760	5.13	31.42	105.61	8.59	22.23
room_un	1	28,460	6.19	34.65	108.34	4.90	14.58
all	0	1,126,740	100.00	298.98	174.79	59.18	30.40
all	1	459,700	100.00	171.22	127.72	20.28	9.79

For the labeling of the variables, see appendix 3.

Table 15: Length of stay according to room type, preferential insurance status and hospital type

room type	pref treat	AZ[kkk]		CZ		PZ	
		N	Mean	N	Mean	N	Mean
room_1p	0	8,287	7.25	489	13.49	93	74.20
room_1p	1	1,325	12.64	84	36.01	51	129.51
room_2p	0	7,284	7.56	258	16.65	39	57.61
room_2p	1	3,679	12.14	141	29.11	18	98.48
room_+2p	0	17,256	7.57	725	16.61	633	62.70
room_+2p	1	10,257	12.14	472	31.79	864	95.99
room_un	0	1,847	6.49	69	13.39	8	34.63
room_un	1	972	8.71	42	33.04	26	87.36
all	0	34,674	7.43	1,541	15.41	773	63.49
all	1	16,233	11.95	739	31.86	959	97.53

For the labeling of the variables, see appendix 3.

[kkk] The results are inclusive Sp-services. Excluding them gives very similar results due to a small number of observations in Sp-services.

Table 16: Supplements and co-payments per stay for inpatient hospitalizations, according to room type and preferential insurance status

Variable	room	pref treat	Supplements per stay		Co-payments per stay		Supplements per day		Co-payments per day	
			Mean	% of total	Mean	% of total	Mean	% of total	Mean	% of total
medical fee_h	room_1p	0	118.32	13.97	26.39	14.86	22.48	13.88	4.67	15.59
	room_1p	1	147.31	16.39	6.14	4.01	21.21	19.15	0.46	4.64
	room_2p	0	17.67	7.04	27.41	15.03	3.98	7.60	4.92	15.07
	room_2p	1	3.46	1.46	3.86	3.73	0.90	3.42	0.26	2.46
	room_+2p	0	2.66	3.75	30.13	17.21	0.56	3.57	5.27	17.48
	room_+2p	1	0.84	1.06	4.50	3.40	0.15	1.57	0.35	3.96
	room_un	0	1.09	3.73	17.96	19.30	0.55	7.28	3.96	21.85
	room_un	1	0.19	0.55	2.20	2.14	0.01	0.29	0.24	1.89
surgical fee_h	room_1p	0	274.51	32.42	0.61	0.34	62.62	38.67	0.11	0.37
	room_1p	1	228.57	25.43	0.06	0.04	38.61	34.86	0.00	0.03
	room_2p	0	42.71	17.02	0.00	0.00	12.08	23.10	0.00	0.00
	room_2p	1	10.34	4.37	0.00	0.00	1.82	6.91	0.00	0.00
	room_+2p	0	4.15	5.86	0.01	0.00	1.47	9.48	0.00	0.01
	room_+2p	1	0.83	1.05	0.00	0.00	0.30	3.22	0.00	0.00
	room_un	0	3.08	10.51	0.00	0.00	1.01	13.31	0.00	0.00
	room_un	1	0.52	1.51	0.00	0.00	0.16	3.40	0.00	0.00
physio fee_h	room_1p	0	0.83	0.10	7.78	4.38	0.10	0.06	0.74	2.47
	room_1p	1	0.35	0.04	7.41	4.84	0.02	0.02	0.38	3.83
	room_2p	0	0.40	0.16	7.02	3.85	0.03	0.07	0.51	1.57
	room_2p	1	0.08	0.03	5.64	5.44	0.00	0.02	0.30	2.80
	room_+2p	0	0.01	0.01	7.62	4.35	0.00	0.01	0.55	1.82
	room_+2p	1	0.00	0.01	6.56	4.95	0.00	0.00	0.32	3.63
	room_un	0	0.03	0.09	4.97	5.34	0.00	0.02	0.35	1.94
	room_un	1	0.01	0.04	6.72	6.52	0.00	0.02	0.29	2.29
gynaec fee_h	room_1p	0	81.43	9.62	0.06	0.03	16.74	10.34	0.01	0.03
	room_1p	1	11.75	1.31	0.00	0.00	2.54	2.30	0.00	0.00
	room_2p	0	3.75	1.50	0.00	0.00	1.12	2.14	0.00	0.00
	room_2p	1	0.43	0.18	0.00	0.00	0.18	0.67	0.00	0.00
	room_+2p	0	0.84	1.18	0.00	0.00	0.18	1.15	0.00	0.01
	room_+2p	1	0.10	0.12	0.00	0.00	0.02	0.23	0.00	0.00
	room_un	0	0.93	3.18	0.00	0.00	0.42	5.46	0.00	0.00
	room_un	1	0.14	0.41	0.00	0.00	0.01	0.27	0.00	0.00
radio fee_h	room_1p	0	22.34	2.64	3.81	2.15	4.57	2.82	1.11	3.72
	room_1p	1	32.72	3.64	1.16	0.76	4.94	4.46	0.27	2.74
	room_2p	0	2.56	1.02	3.69	2.02	0.64	1.23	1.21	3.69
	room_2p	1	0.66	0.28	1.10	1.06	0.14	0.52	0.28	2.64
	room_+2p	0	0.31	0.43	3.24	1.85	0.09	0.58	1.15	3.83
	room_+2p	1	0.10	0.13	1.03	0.78	0.03	0.33	0.28	3.08
	room_un	0	0.20	0.68	1.71	1.83	0.11	1.50	0.62	3.45
	room_un	1	0.09	0.25	0.75	0.72	0.00	0.10	0.18	1.43
drugs_h	room_1p	0	27.66	3.27	5.56	3.13	4.55	2.81	0.70	2.35
	room_1p	1	34.06	3.79	12.95	8.46	3.22	2.91	0.67	6.76
	room_2p	0	25.17	10.03	5.63	3.08	4.10	7.84	0.71	2.18
	room_2p	1	30.04	12.69	9.19	8.87	3.07	11.60	0.68	6.44
	room_+2p	0	21.56	30.44	6.06	3.46	3.36	21.63	0.63	2.10
	room_+2p	1	28.16	35.56	13.07	9.87	2.90	31.34	0.61	6.81

Variable	room	pref treat	Supplements per stay		Co-payments per stay		Supplements per day		Co-payments per day	
			Mean	% of total	Mean	% of total	Mean	% of total	Mean	% of total
	room_un	0	3.96	13.52	11.36	12.20	0.46	6.05	1.29	7.13
	room_un	1	4.62	13.50	19.40	18.82	0.42	8.88	1.60	12.50
impl28_h	room_1p	0	20.36	2.40	1.17	0.66	3.60	2.22	0.16	0.52
	room_1p	1	15.90	1.77	0.02	0.01	1.74	1.57	0.00	0.00
	room_2p	0	21.61	8.61	0.92	0.51	5.14	9.84	0.15	0.46
	room_2p	1	20.07	8.48	1.14	1.10	2.51	9.51	0.08	0.72
	room_+2p	0	8.10	11.43	0.72	0.41	1.82	11.75	0.10	0.33
	room_+2p	1	9.27	11.71	0.55	0.42	1.14	12.28	0.06	0.71
	room_un	0	5.10	17.41	0.00	0.00	0.76	9.98	0.00	0.00
	room_un	1	3.40	9.94	0.00	0.00	0.37	7.76	0.00	0.00
impl35_h	room_1p	0	6.24	0.74	1.33	0.75	0.92	0.57	0.46	1.55
	room_1p	1	8.69	0.97	1.04	0.68	1.12	1.01	0.22	2.20
	room_2p	0	7.54	3.01	1.80	0.99	1.19	2.28	0.77	2.35
	room_2p	1	8.33	3.52	0.70	0.68	1.31	4.95	0.28	2.64
	room_+2p	0	3.05	4.31	0.68	0.39	0.57	3.66	0.30	1.01
	room_+2p	1	3.72	4.70	0.39	0.29	0.63	6.85	0.12	1.33
	room_un	0	1.45	4.96	0.28	0.30	0.42	5.53	0.12	0.67
	room_un	1	1.56	4.56	0.00	0.00	0.52	11.02	0.00	0.00
impl35bis_h	room_1p	0	0.79	0.09	2.74	1.54	0.18	0.11	0.83	2.76
	room_1p	1	0.52	0.06	2.57	1.68	0.13	0.12	0.61	6.13
	room_2p	0	0.93	0.37	3.58	1.96	0.29	0.55	1.15	3.51
	room_2p	1	0.54	0.23	2.54	2.45	0.16	0.60	0.83	7.78
	room_+2p	0	0.40	0.57	2.35	1.34	0.16	1.04	0.78	2.58
	room_+2p	1	0.41	0.51	1.67	1.26	0.11	1.22	0.54	6.02
	room_un	0	0.16	0.53	0.57	0.61	0.07	0.93	0.25	1.40
	room_un	1	0.63	1.85	1.27	1.23	0.16	3.32	0.54	4.18
implnon-reimb_h	room_1p	0	9.49	1.12	0.00	0.00	2.59	1.60	0.00	0.00
	room_1p	1	5.05	0.56	0.00	0.00	0.87	0.78	0.00	0.00
	room_2p	0	15.60	6.22	0.00	0.00	5.49	10.49	0.00	0.00
	room_2p	1	8.66	3.66	0.00	0.00	1.82	6.87	0.00	0.00
	room_+2p	0	7.39	10.43	0.00	0.00	2.65	17.06	0.00	0.00
	room_+2p	1	4.67	5.90	0.00	0.00	1.25	13.48	0.00	0.00
	room_un	0	0.94	3.22	0.00	0.00	0.45	5.86	0.00	0.00
	room_un	1	4.60	13.46	0.00	0.00	0.57	11.91	0.00	0.00
delivery impl_h	room_1p	0	0.00	0.00	12.59	7.09	0.00	0.00	2.47	8.24
	room_1p	1	0.00	0.00	14.76	9.64	0.00	0.00	2.08	20.95
	room_2p	0	0.00	0.00	16.64	9.12	0.00	0.00	3.77	11.55
	room_2p	1	0.00	0.00	17.27	16.66	0.00	0.00	3.01	28.39
	room_+2p	0	0.00	0.00	9.57	5.47	0.00	0.00	2.46	8.17
	room_+2p	1	0.00	0.00	9.96	7.52	0.00	0.00	1.93	21.58
	room_un	0	0.00	0.00	4.87	5.24	0.00	0.00	1.07	5.94
	room_un	1	0.00	0.00	7.22	7.00	0.00	0.00	1.44	11.25
nursing day_h	room_1p	0	238.04	28.11	110.74	62.37	34.32	21.19	17.34	57.89
	room_1p	1	346.15	38.52	106.26	69.44	27.28	24.64	5.16	51.81
	room_2p	0	87.26	34.77	110.87	60.80	12.11	23.15	17.98	55.06
	room_2p	1	129.86	54.84	61.86	59.68	10.89	41.22	4.84	45.62
	room_+2p	0	0.04	0.06	110.36	63.05	0.01	0.05	17.49	57.98
	room_+2p	1	0.04	0.06	94.14	71.08	0.00	0.05	4.67	52.14

Variable	room	pref treat	Supplements per stay		Co-payments per stay		Supplements per day		Co-payments per day	
			Mean	% of total	Mean	% of total	Mean	% of total	Mean	% of total
	room_un	0	0.00	0.00	49.21	52.88	0.00	0.00	9.68	53.46
	room_un	1	0.00	0.00	65.28	63.32	0.00	0.00	8.48	66.18
divcost_h	room_1p	0	37.03	4.37	0.00	0.00	7.64	4.72	0.00	0.00
	room_1p	1	57.81	6.43	0.00	0.00	7.85	7.09	0.00	0.00
	room_2p	0	22.07	8.80	0.00	0.00	5.42	10.37	0.00	0.00
	room_2p	1	22.09	9.33	0.00	0.00	3.33	12.62	0.00	0.00
	room_+2p	0	19.75	27.89	0.00	0.00	4.11	26.46	0.00	0.00
	room_+2p	1	28.66	36.20	0.00	0.00	2.49	26.85	0.00	0.00
	room_un	0	9.85	33.62	0.00	0.00	2.59	34.07	0.00	0.00
	room_un	1	16.10	47.12	0.00	0.00	2.01	42.13	0.00	0.00
paramedical_h	room_1p	0	2.88	0.34	0.00	0.00	0.59	0.37	0.00	0.00
	room_1p	1	2.64	0.29	0.00	0.00	0.28	0.25	0.00	0.00
	room_2p	0	3.57	1.42	0.00	0.00	0.69	1.32	0.00	0.00
	room_2p	1	2.21	0.93	0.00	0.00	0.29	1.08	0.00	0.00
	room_+2p	0	2.49	3.52	0.00	0.00	0.54	3.47	0.00	0.00
	room_+2p	1	2.12	2.67	0.00	0.00	0.22	2.38	0.00	0.00
	room_un	0	2.26	7.71	0.00	0.00	0.70	9.17	0.00	0.00
	room_un	1	2.24	6.56	0.00	0.00	0.52	10.87	0.00	0.00
clinical fee_h	room_1p	0	6.30	0.74	4.55	2.56	0.98	0.61	1.32	4.41
	room_1p	1	7.05	0.78	0.30	0.20	0.88	0.80	0.08	0.80
	room_2p	0	0.12	0.05	4.46	2.45	0.01	0.02	1.45	4.45
	room_2p	1	0.01	0.01	0.16	0.15	0.00	0.01	0.05	0.44
	room_+2p	0	0.03	0.04	3.90	2.23	0.01	0.07	1.39	4.60
	room_+2p	1	0.12	0.15	0.21	0.16	0.01	0.10	0.06	0.67
	room_un	0	0.15	0.52	2.05	2.21	0.06	0.79	0.75	4.13
	room_un	1	0.03	0.10	0.15	0.14	0.00	0.02	0.03	0.26
other_h	room_1p	0	0.62	0.07	0.25	0.14	0.09	0.05	0.03	0.10
	room_1p	1	0.11	0.01	0.36	0.24	0.03	0.02	0.01	0.11
	room_2p	0	0.01	0.00	0.35	0.19	0.00	0.00	0.03	0.10
	room_2p	1	0.02	0.01	0.19	0.18	0.00	0.00	0.01	0.09
	room_+2p	0	0.05	0.06	0.41	0.23	0.00	0.02	0.03	0.10
	room_+2p	1	0.13	0.17	0.36	0.27	0.01	0.09	0.01	0.07
	room_un	0	0.09	0.32	0.09	0.09	0.00	0.05	0.01	0.05
	room_un	1	0.05	0.14	0.10	0.10	0.00	0.02	0.00	0.03
Total_h	room_1p	0	846.83	100.00	177.57	100.00	161.96	100.00	29.95	100.00
	room_1p	1	898.67	100.00	153.03	100.00	110.75	100.00	9.95	100.00
	room_2p	0	250.95	100.00	182.37	100.00	52.30	100.00	32.66	100.00
	room_2p	1	236.81	100.00	103.65	100.00	26.42	100.00	10.62	100.00
	room_+2p	0	70.82	100.00	175.04	100.00	15.53	100.00	30.16	100.00
	room_+2p	1	79.17	100.00	132.43	100.00	9.26	100.00	8.95	100.00
	room_un	0	29.28	100.00	93.07	100.00	7.61	100.00	18.10	100.00
	room_un	1	34.18	100.00	103.09	100.00	4.76	100.00	12.81	100.00

For the labeling of the variables, see appendix 3.

Key points

- **Ambulatory supplements are underestimated in our data because registration is not compulsory and information on OTC drugs is lacking.**
- **While ambulatory supplements are on average much lower than hospital supplements, they may become large for some persons. Large ambulatory supplements are related mainly to paramedical fees and to drugs.**
- **A hospital stay does not only lead to larger hospital supplements, but also has a significant positive effect on ambulatory supplements for specialist fees.**
- **Average hospital supplements are dominated by fee supplements and room supplements. For surgery and gynaecology the former are on average 100% of the convention tariff. Implants also may generate large OOP payments.**
- **Supplements related to an inpatient stay in a hospital are very strongly differentiated according to room type. In 2003, they amounted to more than €800 in a single room, more than €200 in a two-person room and about €70 in a common room.**
- **A longer length of hospital stay clearly increases supplements. For each room type separately, OOP payments per stay hardly differ between patients with and without preferential treatment, because the effects of the protective regulation are compensated by a longer length of stay.**

2.4 WHO RAISES SUPPLEMENTS? A FIRST LOOK AT REGIONAL AND SUPPLY-SIDE EFFECTS

As mentioned in the introduction, the supplements paid are caused by different factors. The results shown in the previous sections reflect the joint or combined effect of all these structural factors. We have argued that they were heavily influenced by the differential morbidity, i.e. the differential health care needs of the different groups. However, certainly from a policy point of view, it is necessary to distinguish carefully the effects of morbidity on the one hand and of regulatory measures and supply-side behaviour (price setting) on the other hand. To some extent, this was already done in the regression results in Tables 7, 11 and 12, where the effects of the dummies for provinces and for preferential treatment give the effect on supplements (and co-payments) of these variables after controlling for all the observable morbidity indicators that have been included in the regressions. However, as we mentioned there, these observable morbidity indicators capture only part of the total differences in morbidity. It would for instance be extremely dangerous to interpret the effect of preferential treatment in these tables as a pure effect of regulation. Remember also the poor statistical performance of the model for supplements in Table 7 in comparison to the primitive linear regression of supplements on total "official" health care costs, possibly a reasonably good measure of morbidity.

Given all this, it would be interesting if we could gather some insights in the (unit) "own prices" to be paid for different health care items[III]. Calculating these unit prices is not easy, however. If we had data available at the level of the individual items of the nomenclature, it would be straightforward to calculate unit prices as the sum of the co-payment (lump sum or proportional) and the average supplement to be paid. The first component is in principle defined by the regulation in place and should be identical for all providers; the second component follows from decisions taken by providers (whether or not to accept the general tariff agreement and whether or not to set different tariffs) and hospitals (whether or not to ask supplements). Of course, there are too many different items in the nomenclature to perform a reasonable analysis at

[III] When we speak about "prices" in this and the following sections, we always refer to the personal price to be paid by the individual patient and not to the cost from the point of view of society.

that level of detail. Moreover, we have only expenditure data at a more aggregated level, i.e. an aggregate of items for which regulations and provider behaviour may be different. Expenditures (and quantities) at this more aggregate level will also be influenced by morbidity and by variations in medical practice. Given this level of aggregation, we cannot simply construct an overall quantity index by simply adding the quantity indicators of the different individual items because the latter are often expressed in units which are not directly comparable.

In this section we propose another route to get an idea about prices. We calculate for the different subcategories, introduced in the previous section, and for all individuals with non-zero expenditures, the ratio of supplements over total "official" health care expenditures (the sum of ZIV-reimbursements and co-payments). This denominator does definitely not capture morbidity in a perfect way, but it gives in any case an indication of the total quantity of health care consumed by the individual. Given the important differences in regulation depending on whether the patient is entitled to preferential treatment or not, we do this separately for these two groups of patients.

While we suggest that the resulting ratios are a first approximation of unit prices, we are of course well aware that this approximation is far from perfect and this for at least two main reasons:

1. our expenditure categories are an aggregate of many nomenclature items. As mentioned before, differences in the calculated "prices" will therefore also reflect differences in the composition of the aggregate. These differences in composition may reflect differences in morbidity, but also variations in medical practice.
2. the proportional adjustment is perfect for co-payments (or supplements) that are expressed as a fixed percentage of the ZIV-reimbursements. This is not always the case, however. If co-payments are subject to ceilings or are expressed as a lump sum amount, the proportional correction may give a misleading picture.

Caution is therefore needed in interpreting the results shown in this section[mmm]. We will first discuss the results for the ambulatory supplements and then turn to the results for hospital supplements. As in the previous section, the latter analysis is based on the data for hospital stays.

2.4.1 Regional and supply-side effects for ambulatory supplements (tables 17 and 18)

Table 17 gives the significant results of regressions in which the dependent variables are the price approximations for the ambulatory supplements. To simplify the reading of the table we only show the coefficients if the effect is significantly different from zero ($p<0.0001$). In the other cases we simply indicate the sign of the (imprecisely estimated) effect. To interpret the pattern of unit prices, we make a distinction according to insurance status (1 referring to preferential treatment). The mean unit prices given in the third column are low. Moreover, they are clearly lower for those on preferential treatment. Note that the mechanical effect of a shift from co-payments to reimbursements is controlled for in these calculations, because we have in the denominator the sum of these two components.

The indicator of "province" in Table 17 refers to the province in which the patient is living. The reference province is Antwerpen. A comparison between the overall means (in column 3) and the intercepts in the regressions (i.e. the estimated value for Antwerpen) immediately shows that ambulatory supplements are larger in Antwerpen than the overall mean. In fact, the overall sign pattern is very suggestive: ambulatory supplements seem to be lower in the French-speaking part of the country, in Brussels

[mmm] Moreover it is important to emphasise that a "cheaper" hospital for the patient (i.e. our definition of unit price), is not necessarily also a cheaper hospital for RIZIV/INAMI, since larger ZIV-reimbursements (keeping supplements constant) will increase the denominator and automatically lead to a decrease in the calculated unit prices.

and in Limburg, while the other Flemish provinces hardly differ from Antwerpen. The differences are especially striking for specialist fees[nnn]. The most outspoken negative effects are found in Hainaut and Namur.

Since we have approximated "unit prices" as the dependent variable, we hypothesize that these interregional differences are not due to morbidity differences, but mainly reflect supply-side behaviour. If this hypothesis is true, we would a priori expect a correlation between price-setting behaviour and the acceptance by physicians of the general tariff agreement that is negotiated at the national level. In fact, doctors can only raise supplements if they do not abide by this general agreement. To see whether this link exists, we show in Table 18 the regional distribution of doctors that did not accept the general tariffs in the year 2003, more specifically the proportion of refusals on 19/12/2002.

Taking Antwerpen as the reference, we see that much higher rates of refusal are found for the general practitioners in Brussels, Brabant Wallon, Hainaut, Liège and Luxembourg and much lower rates of refusal in West-Vlaanderen, Oost-Vlaanderen and Limburg. We would therefore expect positive signs in the former and negative signs in the latter provinces. The results are not really convincing. They are somewhat better for the specialists, where we see in Table 18 much smaller refusal rates for Hainaut and Namur. These seem to be rather well reflected in the results of Table 17.

These results may offer part of the explanation for some of the regional effects that were described in Table 7. However, extreme caution is needed in interpreting these results. As mentioned before, the data on ambulatory supplements are not complete. The regional effects in Table 17 may therefore simply reflect regional differences in reporting behaviour. The data for the hospital supplements are probably much better. Let us now turn to these.

[nnn] Specialist fees here refer to the categories special_amb, geneeshspec_amb and heelkunde_amb.

Table 17: Regional effects for ambulatory supplements

	Pref treat	Dep mean	R^2_a	ref	Vl_Brab	W_Vl	O_Vl	Limburg	Brussels	Brab_W	Hainaut	Liège	Luxemb	Namur
drugs_a	0	0.00	.00	+.01	-	-	-	-.01	-.01	-	-.01	-.01	-	-
	1	0.00												
GP_a	0	0.01	.00	+.00	+	-	-	-	+	+.01	-	-	+	+
	1	0.01												
special_a	0	0.02	.00	+.02	-	-	+	-.01	-.00	-	-.01	-.01	-.01	-.01
	1	0.01	.01	+.01	+	+	+	-	-.01	-	-.01	-.00	-	-.01
physspec_a	0	0.03	.01	+.04	-.01	+.01	+	-.01	-.03	-.01	-.03	-.02	-	-.02
	1	0.02	.01	+.03	+	+	+	+	-.02	-	-.02	-.01	+	-.01
surgery_a	0	0.04	.01	+.04	+	-.02	-	-.02	+.02	+	-.03	-	-.03	-.02
	1	0.02	.00	+.02	-	-	+	-	-	-	-.01	-	-	-
physioth_a	0	0.01	.00	+.01	-	-	-	-	-	+	-.01	-.01	-	-
	1	0.01	.01	+.02	-	-	-	-	-.01	-	-.02	-.01	-	-
paramedical_a	0	0.05	.01	+.09	-	-	-	-	-.07	-.04	-.07	-.06	-.05	-
	1	0.02	.00	+.03	+	+	+	+	-	+	-	-	-	-
dental_a	0	0.02	.00	+.02	+	+.01	+	-	-.01	-	-.01	-.01	+	-
	1	0.01	.00	+.02	+	+	+	-	-	-	-	-	+	-
clinical_a	0	0.00	.00	+.00	+.00	+.00	+	+	-	+	-	-	-	-
	1	0.00												
other_a	0	0.02	.04	+.02	+.01	+.02	+	+.03	-.01	+	-.01	-.01	-.01	-.01
	1	0.01	.01	+.01	+.01	+	+.00	-	-.01	-	-.01	-.01	+	-.00

For the labeling of the variables, see appendix 3.

Table 18: Percentage of doctors that do not accept general tariffs

District	% refusals : 19/12/2002	
	General Practitioners	Specialists
District of Antwerpen	10.14	19.45
District of Mechelen	4.08	17.79
District of Turnhout	19.96	13.66
Province of Antwerpen	*11.18*	*18.25*
Brussel-Capital Region	26.18	23.13
Brussel-Captial Region	*26.18*	*23.13*
District of Halle-Vilvoorde	16.12	22.14
District of Leuven	4.84	14.79
Province of Vlaams Brabant	*10.31*	*18.58*
District of Nivelles	25.91	23.04
Province of Brabant Wallon	*25.91*	*23.04*
District of Brugge	4.04	11.56
District of Diksmuide	0	31.58
District of Ieper	2.07	21.97
District of Kortrijk	2.36	24.62
District of Oostende	2.42	8.22
District of Roeselare	4.76	28.57
District of Tielt	4.35	23.08
District of Veurne	31.68	22.73
Province of West-Vlaanderen	*4.92*	*18.39*
District of Aalst	3.41	25.79
District of Dendermonde	10.98	19.42
District of Eeklo	9.43	12.94
District of Gent	4.39	22.17
District of Oudenaarde	1.26	20.44
District of Sint-Niklaas	1.74	23.41
Province of Oost-Vlaanderen	*4.68*	*22.19*
District of d'Ath	18.33	10
District of Charleroi	29.14	12.01
District of Mons	29.8	9.73
District of Mouscron	7.06	8.22
District of Soignies	27.34	9.09
District of Thuin	33.04	10.76
District of Tournai	25.54	10.36
Province of Hainaut	*27.41*	*10.51*
District of Huy	15.64	22.17
District of Liège	23.68	21.98
District of Verviers	37.39	31.4

District	% refusals : 19/12/2002	
	General Practitioners	Specialists
District of Waremme	20.61	25.93
Province of Liège	*25.73*	*23.93*
District of Hasselt	2.2	19.32
District of Maaseik	1.26	14.8
District of Tongeren	3.52	21.12
Province of Limburg	*2.23*	*18.92*
District of d'Arlon	28.13	20.37
District of Bastogne	44.44	21.82
District of Marche-en-famenne	7.69	28.99
District of Neufchateau	41.9	23.16
District of Virton	23.26	14
Province of Luxembourg	*28.57*	*22.02*
District of Dinant	10.88	15.19
District of Namur	11.66	11.19
District of Philippeville	31.53	7.14
Province of Namur	*13.91*	*11.63*
Belgium	*15.78*	*19.59*

Source: RIZIV[12]

2.4.2 Regional and supply-side effects for hospital supplements (tables 19a and 19b)

For the analysis of "unit prices" (personal costs of the patients in terms of supplements) it is of course preferable to work again with the data at the level of the individual hospital stays:

working at the level of the hospital stays brings us closer to the theoretical concept of a unit price and improves our correction for differences in morbidity. Moreover, it increases considerably the number of relevant observations.

as described before, there is detailed regulation of supplements. We will therefore differentiate unit prices according to preferential treatment and perform a separate analysis for the different room types (single room, two-person room and common room). The remainder category for which the type of room is unknown will be introduced in the analysis as a separate category.

for the hospital stays, we also know the geographical location of the hospital. This is obviously more relevant in an analysis of supply-side behaviour than the province of residence of the patient. We therefore introduce the former in our regression analysis. Moreover, we have additional information on the characteristics of the hospitals. We can distinguish between acute hospitals, chronic hospitals[ooo] and psychiatric hospitals. We can also distinguish private and public hospitals[ppp]. Finally, we know the size of the hospital.

[ooo] Chronic hospitals are either geriatric hospitals, or hospitals that are specialized in specific services such as palliative care and rehabilitation.

[ppp] The public-private distinction is not unambiguous and has even become more ambiguous through the recent merger waves. We simply followed the classification used in the central files of the Federal Public Service – Health, Food chain safety and Environment.

The data therefore offer a good basis for a first analysis of the price-setting behaviour in the hospital sector. For a complete explanation, however, more information would be needed about the detailed financial streams within the hospitals, including the degree of revenue splitting with physicians.

We limit our analysis to inpatient hospitalisations. The results for the (approximated) unit prices, calculated as a percentage of ZIV-reimbursements + co-payments are given in Table 19a. For some categories of expenditures, there are no ZIV-reimbursements and therefore calculating the proportion is not possible. For these categories we correct for morbidity by dividing supplements by the length of the stay in the hospital. This holds for non-reimbursed implants, for paramedical material and for diverse costs. We also have calculated the room supplements per day[qqq]. The regression results for these categories are given in Table 19b. As in Table 17, we only show the value of the coefficients if the effect is significantly different from zero ($p<0.0001$). In the other cases we simply indicate the sign of the effect. If no significant effects could be found, we leave the resulting rows blank.

Before interpreting the statistical results, it is revealing to look at the dependent means given in the second column. These are much larger than in the ambulatory sector. For some subcategories (surgical and gynaecological fees and implants-article 28 in a single room) the supplements per stay are as large as the sum of ZIV-reimbursements and co-payments. In general, the effects of the regulation clearly show up in these means.

The reference category in Table 19 is a stay in the province of Antwerpen, in an acute and public hospital with 250-500 beds. The most important conclusions can then be summarised as follows:

- the geographical pattern is unambiguous. Moreover, since we have been able to introduce hospital characteristics, their confounding influence has been controlled for. Supplements per stay are much larger in hospitals in Brussels, they are larger in Liège and (to a lesser extent) in Luxembourg. Room supplements per day are larger in Brussels and (to a lesser extent) in Vlaams Brabant, Brabant Wallon, Liège and Luxembourg. Patients admitted in a single room pay about €50 additional room supplements per day in comparison to Antwerpen.
- the geographical differentiation is strong for medical fee supplements and for room supplements. It is much weaker for paramedical material (where the reference Antwerpen is the most expensive). Again, we do not find any significant effects for implants. This strengthens the conclusions that were already derived from Table 12, since we can interpret the dependent variables in Table 19 in a sharper way as prices. We can therefore draw with some confidence the conclusion that there is not much geographical differentiation with respect to the personal prices for implants. At the same time, we have to reassert that our approach does not allow us to say anything about the geographical distribution of the number of implants. This question deserves more attention.
- most of the significant geographical differences refer to the prices of a stay in a single room. However, the larger prices in Brussels also extend to two-person rooms and in some cases even to common rooms.
- supplements on medical fees for patients without preferential treatment are slightly larger in psychiatric hospitals as compared to the reference category of acute hospitals. Room supplements per day,

[qqq] Given the financing system of the hospitals, the ZIV-reimbursements can only be allocated over the individual stays in an imperfect way. Moreover, calculating room supplements per day to correct for morbidity differences seems a sensible thing to do.

however, are significantly smaller in psychiatric hospitals (about €19 in single rooms and €7 in two-person rooms).

- single and two-person room supplements are significantly lower in West-Vlaanderen, and higher in larger hospitals. Private hospitals have larger supplements in single rooms, in two-person rooms however they are smaller.
- after controlling for all the other effects, the size of the hospital does not matter very much. Fee supplements and room supplements in private rooms are significantly larger in private hospitals. The effects are not very strong, however.

Table 19 gives the regression results for a specification in which the geographical dispersion is captured by indicators of the province. As mentioned before, we also ran regressions in which we substituted the district (arrondissement) level for the province. Given the limited number of hospitals in some districts, these estimations are in some cases rather problematic from a statistical point of view. In any case, they did not offer any argument to change the conclusions described in this section.

We have performed some exercises to further disaggregate the different fee supplements according to the specialty of the doctors. The behaviour of doctors with respect to supplements might indeed depend on the level and structure of their remuneration in the official tariff structure. The number of observations in one cell became very small, however, and therefore the results were not very revealing and even potentially misleading. More detailed data are needed for a more thorough study of the "price setting" behaviour of different specialists.

Table 19a: Regional and supply-side effects for hospital supplements (approximation of unit prices) (inclusive zero consumption)

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Br	W-Vl	O-Vl	Limb	Bruss	Brab_W	Hain	Liège	Lux	Nam	hosp_chron	hosp_psych	bed_-250	bed_ +500	hosp_priv
medical fee_h	0; room_1p	0.26	.04	+.22	-	+	+	-	+.27	+	-	+.11	+	+	+	+.32	-	-	+
	1; room_1p	0.28	.07	+.28	+	-	+	-	+.38	+	-	+.22	+	-	+	-.28	-	-	-
	0; room_2p	0.03	.05	-	-	-	+	-	+.14	-	-	+	6	-	+	+.16	-	+	+.04
	1; room_2p	0.01	.03	+	+	-	+	-	+.03	-	-	+	-	-	+.02	-	-	-	+
	0; room_+2p	0.01	.00	+	-	-	-	-	+	-	-	-	-	-	+	+.03	-	+	+
	1; room_+2p																		
	0; room_un	0.01			-														
	1; room_un	.00																	
surgical fee_h	0; room_1p	0.87	.14	+.68	-	-	-	-	+.61	+0.50	-	+.48	+	+	+	-	-	-	+.17
	1; room_1p	0.65	.10	+.58	-	-	-	-	+.40	+	-	+.36	+	+	-	-	-	-	+
	0; room_2p	0.13	.15	+	-	-.09	-	-	+.35	-	-	+	-	-.13	+.15	-	-.07	-	+.10
	1; room_2p	0.03	.06	+	+	-	+	-	+.09	-	-	-	-	-	+.10	-	-	-	+
	0; room_+2p	0.02	.02	+	-	-	-	-	+.03	-	-	+	-	-.05	+	-	-.03	-	+.03
	1; room_+2p	0.01	.01	+	-	-	-	-	-	-	-	-	-	-	+.13	-	-	+	+
	0; room_un	0.04																	
	1; room_un	0.01																	
physio fee_h	0; room_1p	0.03	.09	+	-	-.05	-	-	+.08	-	-.05	-	-	-	-	-	-	+	+.03
	1; room_1p	0.00																	
	0; room_2p	0.02	.14	-.03	-	-	-	-	+.06	-	-	+	+	+	-		+	+.02	+.03
	1; room_2p	0.00	.03	-	-	-	-	+	+.01	-	+	+	+	+	-		+	+	+
	0; room_+2p	0.00																	
	1;	0.00																	

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Br	W-Vl	O-Vl	Limb	Bruss	Brab_W	Hain	Liège	Lux	Nam	hosp_chron	hosp_psych	bed_-250	bed_ +500	hosp_priv
	room_+2p																		
	0; room_un	0.00			-														
	1; room_un	0.00																	
gynaec fee_h	0; room_1p	1.00	.21	+7.4	-	-	-	-	+.77	+.67	-	+.49	+	+	+.65		+	-	+.14
	1; room_1p	0.98	.06	+	-	-	-	+	+	-	-	+	+	-	+		-	-	-
	0; room_2p	0.24	.18	+	+	-	+	-	+.50		+	+	-	-	+.59		+	+	+
	1; room_2p	0.05	.54	+	-	-	-	-	+		-	-	-	-	+1.31		-	-	+
	0; room_+2p	0.04																	
	1; room_+2p	0.01																	
	0; room_un	0.07																	
	1; room_un	0.01																	
radio fee_h	0; room_1p	0.17	.03	+.09	-	+	-	+	+.11	+	-	+.11	+.17	+	+.08	-	-	+	+.07
	1; room_1p	0.22	.07	+.16	-	-	+	-	+	+	-	+.14	+	-	+		-	+	+.13
	0; room_2p	0.02	.08	-.01	+	+	+	-	+.05	-	-	+.02	+	-	+	+	-	+	+.03
	1; room_2p	0.00	.04	+	+.02	-	+	-	+	-	-	+	-	-	-	-	-.01	-	+
	0; room_+2p	0.00	.02	-	-	+.01	-	+	+	-	-	+	+	-	-	+	-	+	+.00
	1; room_+2p	0.00	.01	+.00	+	-	-	-	+	-	-	-	-	-	-	-	-	-.00	+
	0; room_un	0.00																	
	1; room_un	0.00																	
drugs_h	0; room_1p	0.65	0.01	+.73	-	+	+	+	+	-	+	+	+	+	+	-.65	-	-	-
	1; room_1p	0.28																	
	0; room_2p	0.31																	

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Br	W-Vl	O-Vl	Limb	Bruss	Brab_W	Hain	Liège	Lux	Nam	hosp_chron	hosp_psych	bed_-250	bed_ +500	hosp_priv
	1; room_2p	0.26																	
	0; room_+2p	0.39	0.00	+.44	-	-	-	-	+	-	+	-	+	+	-	-	+	+	-
	1; room_+2p	0.31																	
	0; room_un	0.10	.08	+	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-
	1; room_un	0.09	.09	+	-	+	+	-	-	-	-	-		-	-	-	+.36	-	-
impl28_h	0; room_1p	1.03																	
	1; room_1p	0.74																	
	0; room_2p	1.17																	
	1; room_2p	0.83																	
	0; room_+2p	0.71																	
	1; room_+2p	0.62																	
	0; room_un	0.83																	
	1; room_un	0.27																	
impl35_h	0; room_1p	0.38																	
	1; room_1p	0.26																	
	0; room_2p	0.31																	
	1; room_2p	0.27																	

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Br	W-Vl	O-Vl	Limb	Bruss	Brab_W	Hain	Liège	Lux	Nam	hosp_chron	hosp_psych	bed_-250	bed_ +500	hosp_priv
	0; room_+2p	0.32																	
	1; room_+2p	0.25																	
	0; room_un	0.30																	
	1; room_un	0.29																	
impl35bis_h	0; room_1p	0.23																	
	1; room_1p	0.13																	
	0; room_2p	0.24																	
	1; room_2p	0.18																	
	0; room_+2p	0.19																	
	1; room_+2p	0.15																	
	0; room_un	0.07																	
	1; room_un	0.29																	
clinical fee_h	0; room_1p	0.12	.04	+	+.13	+	+.15	+	+.21	-	+.23	+.31	+.45	+	+	-	-	-	+
	1; room_1p	0.12	.17	+	+	-	+	-	+.18	+	+	+.37	+.41	+	-	-	-	+	-
	0; room_2p	0.00																	
	1; room_2p	0.00	.02	+	+	+	+	+	+.00	-	+.00	-	-	+	+.00	-	+	+	-
	0; room_+2p	0.00	.00	+	+	+	+	+	+.00	-	+	+	-	-	-	-	-	-.00	-

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Br	W-Vl	O-Vl	Limb	Bruss	Brab_W	Hain	Liège	Lux	Nam	hosp_chron	hosp_psych	bed_-250	bed_ +500	hosp_priv
	1; room_+2p	0.00	.01	+	-	-	+	+	+.01	-	+	+	-	-	-	-	-	-.01	+
	0; room_un	0.01																	
	1; room_un	0.00																	
other_h	0; room_1p	0.05	.09	+	-	-	-.09	-	+	+	-	-	+.45	-	-	-	+	+	+
	1; room_1p	0.05	.69	+	-	-	-	-	-		-	+	+1.30	-	+	+	+	+	+
	0; room_2p	0.00																	
	1; room_2p	0.01																	
	0; room_+2p	0.03	.03	-	-	-	-	-	+	+.96	-	-	+	-	+.61	-	+	+	+
	1; room_+2p	0.03																	
	0; room_un	0.00																	
	1; room_un	0.00																	

For the labeling of the variables, see appendix 3.

Table 19b: Regional and supply-side effects for hospital supplements (absolute amounts) (inclusive zero consumption)

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Brab	W_ Vl	O_ Vl	Limburg	Brussels	Brab_W	Hainaut	Liège	Luxemb	Namur	hosp_ chron	hosp_psych	bed_-250	bed_+500	hosp_priv
implnon-reimb_h	0; room_1p																		
	1; room_1p																		
	0; room_2p																		
	1; room_2p																		
	0; room_+2p																		
	1; room_+2p																		
	0; room_un																		
	1; room_un																		
nursing day_h	0; room_1p	34.32	0.41	20.56	12.34	-7.48	-6.77	-4.23	51.37	27.77	+	11.08	13.55	13.09	-	-19.46	-5.64	6.19	7.75
	1; room_1p	27.28	0.45	18.39	14.17	-6.54	-	-	48.37	+	+	9.63	+	+	-	-18.87	-	5.58	4.93
	0; room_2p	12.11	0.31	11.81	5.79	-1.41	0.86	-	5.58	7.25	+	2.99	5.46	-7.81	1.68	-6.41	-0.87	2.00	-1.82
	1; room_2p	10.89	0.33	11.29	6.75	-1.44	1.56	+	6.49	7.64	+	3.03	5.56	-7.18	+	-7.08	-1.45	1.97	-2.04
	0; room_+2p																		
	1; room_+2p																		
	0; room_un																		
	1; room_un																		
divcost_h	0; room_1p	7.64	0.01	+	+	+	+	-	+	+	11.75	-	19.47	+	-	-	-	+	-
	1; room_1p																		
	0; room_2p																		
	1; room_2p																		
	0; room_+2p	4.11	0.00	3.42	2.85	+	+	-	-	+	-	-	-	+	-	-	-	2.25	-

	Pref treat; room	Dep mean	R^2_a	ref	Vl_ Brab	W_ Vl	O_ Vl	Limburg	Brussels	Brab_W	Hainaut	Liège	Luxemb	Namur	hosp_ chron	hosp_psych	bed_-250	bed_+500	hosp_priv
	1; room_+2p	2.49	0.01	2.89	+	-	+	+	-	-	-1.80	-2.01	-	+	+	-1.83	+	+	-
	0; room_un																		
	1; room_un																		
paramedical_h	0; room_1p																		
	1; room_1p																		
	0; room_2p	0.69	0.01	-	-	-	+	+	+	+	+	3.23	+	+	-	-	+	+	+
	1; room_2p																		
	0; room_+2p	0.54	0.00	-	-	-	+	+	-	+	+	+	+	+	+	-	+	+	+
	1; room_+2p	0.22	0.01	+	-	-	+	+	+	+	+	+	+	+	+	-0.21	+	+	+
	0; room_un	0.70	0.09	2.36	-3.38	-3.17	-3.23	-2.94	-3.02	-	-2.98	-1.95	-	-2.66	-	+	2.19	+	0.94
	1; room_un	0.52	0.06	-	+	+	-	3.68	+	+	-	+	5.63	+	+	+	-	+	-

For the labeling of the variables, see appendix 3.

Key points

- **To approximate the price-setting behaviour of providers and hospitals we approximate unit prices by taking the ratio of supplements over the conventional tariff.**
- **There is some weak evidence that ambulatory supplements are lower in the French-speaking part of the country, in Brussels and in Limburg.**
- **Supplements per hospital stay are much larger in hospitals in Brussels, they are also larger in Liège and (to a lesser extent) in Luxembourg. The geographical differentiation is particularly strong for medical fee supplements and for room supplements.**
- **Room supplements per day are smaller in psychiatric hospitals.**

2.5 SUPPLEMENTS IN HOSPITALS: A DEEPER ANALYSIS

While the results in Table 19 give us a better insight into the supply-side factors influencing the level of supplements, they also suggest some additional questions. To understand better the structural determinants that lie behind the reduced form results in Tables 7 and 12, a further analysis is needed of at least three features:

- hospital supplements are the most important component in total supplements. Moreover, a stay in a hospital also leads to an increase in ambulatory supplements. We should therefore answer the question: who ends up in a hospital? Of course, this will in the first place be determined by medical factors. However, it is not to be excluded that other factors may also play a role.
- the price of a hospital stay crucially depends on the type of room in which the stay takes place. The choice of room will therefore necessarily play an important role in the distribution of supplements in the population. The determinants of this choice will be a mixture of medical and preference considerations.
- supplements are higher in private hospitals. The choice of a private hospital is to some extent a matter of preferences too, although the regional spread of hospitals also may play a significant role. Who opts for a private hospital?

We will first analyse these different decisions separately and then illustrate how the information given in different subsections can be combined to give an overall picture.

Before we turn to a discussion of our results, it is good to repeat the main lacuna in this chapter: we do not know if our individuals have supplemental hospital insurance. It is evident that this may be of crucial importance in their choices related to room and hospital type. Our results again have to be seen as a kind of reduced form in which the effects of the different personal characteristics will also take up the possible availability of hospital insurance. As said before, we will return to the problem of supplemental hospital insurance in chapter 3.

2.5.1 Who ends up in which room in which hospital? (table 20)

In Table 20 we collect the results for the different decisions described before. In each case we summarise the results in terms of the resulting odds effects, the interpretation of which has been explained already referring to Table 8. We always keep the same reference individual. Significant results ($p<0.0001$) are printed in bold.

1. The determinants of hospital stays (Table 20, column 1)

Let us look first at the results in the first column of Table 20. Here the observation unit is the individual and the dependent variable is "having had at least one inpatient hospital stay during the year". This will of course have a direct influence on hospital supplements. However, in Table 11 we have used a similar variable as an independent variable (the stays in day hospitalisation were included there) and it turned out to have a significant influence on the ambulatory supplements to be paid for specialists and for surgery. Therefore the personal characteristics which have a significant influence in Table 20 will not only influence the amount of hospital supplements to be paid, but will also have an "indirect" effect on these ambulatory supplements.

In the light of the reasoning in the previous sections, we would expect a priori a large overlap between the significant determinants of a hospital stay and the individual characteristics that had a significant influence on supplements in the Tables 7 and 12. The first column in Table 20 corroborates our hypothesis for many of the included characteristics. Compared to the reference individual, the very young and the old have a larger probability of being taken up in a hospital at least once. The birth effect is not only obvious for the newborn (children less than one year old), but also for women in the relevant ages. Not surprisingly, very strong effects are found for the last year of life and for primary incapacity. The latter result sustains our earlier hypothesis about the link between primary incapacity and having to pay hospital supplements. The disabled and the handicapped have a larger probability of being taken up in the hospital than the reference person, but the effect is much less outspoken than for primary incapacity, again in line with our previous results.

In earlier sections we have pointed to the relatively low supplements to be paid by the economically vulnerable groups: the residents at low income (res_lowY), the unemployed (variables unemployed, parttime, early_retired and ben_unempl), and the individuals who are entitled to a guaranteed minimum income (variables guarant_Y). Although the pattern of results in Table 20 is somewhat mixed, it strongly suggests that these lower supplements are not caused by a smaller probability of take-up in a hospital. This again is a counterindication for the hypothesis of underconsumption. The same conclusion holds a fortiori for the effect of preferential treatment.

Let us finally look at the regional effects. These are in this case quite revealing. In previous sections, we have seen a tendency for higher hospital supplements to be paid in Brussels, Brabant Wallon and Liège and for lower hospital supplements to be paid in Hainaut. Table 20 clearly shows that these differences are not caused by a differential probability of take up. In fact, the results are the opposite: there is a larger probability of being taken up in a hospital in Hainaut, and a smaller one in Liège, Brabant Wallon and especially Brussels. The regional differentiation in hospital supplements is therefore most probably not caused by unobservable morbidity factors which were not captured by the variables included in Tables 7 and 11. We will further refine our insights by looking at the determinants of room choices.

2. The choice of room (Table 20, columns 2 and 3)

For the analysis of the choice of room we return to the hospital stay as the unit of observation[rrr]. The information about the choice of room is missing in about 40% of the observations; most of the observations with missing room type, are day hospitalisations. For inpatient hospitalisations, room type is missing for only 5% of the observations and there are no indications of a selection problem. We therefore restrict the analysis to inpatient hospitalisations where the room type is known. Of these, about 58% are in common rooms, 20% in single rooms and 21% in two-person rooms (see also Table 14).

The statistical analysis of the choice of room is complicated by the fact that we now have to distinguish three categories: single room, two-person room and common room.

[rrr] Since the same individual may have different stays in a year, there is a statistical problem of clustering. We neglect this problem, which may reasonably be assumed to be negligible given the very large number of individuals and the small degree of clustering in our sample.

We therefore have estimated a multinomial choice model. The results are summarised in the usual way in the second and the third column of Table 20. In addition to the usual reference individual we now also have to choose a reference room type: in our case we opted for the common room. The odds effects in the second column are then to be interpreted as an indication of the effect on the relative probability of the respective category compared to the reference individual of choosing a single room rather than a common room. Analogously, the odds effects in the third column give an indication of the effect on the relative probability of the respective category compared to the reference individual of choosing a two-person room rather than a common room. One cannot derive from a simple comparison of the odds effects in the second and third column any conclusions about the probabilities of choosing a single room rather than a two-person room.

From the descriptive analysis in previous sections, we know that the choice of room will have a crucial influence on the amount of hospital supplements to be paid. The room type in our database is the type chosen by the patient. In some cases, a person can be taken up in a single room for medical reasons; when this occurs and the patient had chosen initially a common room, his room type as recorded in our data is still that of a common room, although he is actually staying in a single room. As described in chapter 1, in this case no single room or fee supplements can be charged.

Conditional on all the other variables included, older patients have a much larger probability of a stay in a single room or a two-person room. It seems reasonable to hypothesize that this is in the first place the result of morbidity differences. Maternity stays to a large extent take place in single rooms, as shown by the odds for women between 20 and 40 in the second (and the third) column. Since this may be interpreted as mainly a consequence of free choice, it largely explains the larger hospital supplements to be paid by these patients. A striking effect is found for children: they have a larger probability than our reference individual to stay in a common room (both when we compare to single rooms and to two-person rooms).

As before, the chronically ill and those on primary incapacity show a similar picture: there are no large differences with the reference individual, although there is some suggestion that they are taken up more often in single rooms. For the disabled and the handicapped the results are different: they stay much more in common rooms than our reference individual (both compared to single rooms and to two-person rooms). This effect is even stronger for patients with preferential treatment and for the weaker socioeconomic groups (as detailed before). For preferential treatment, this confirms what we had already seen in Table 14. It is striking, however, that the same pattern is found for all weaker socioeconomic groups. The conclusion is clear: the disabled, the handicapped, those with preferential treatment and the weaker socio-economic groups do not go less often to a hospital (as shown in column 1), but if they are taken up they dominantly get a common room. Remember that this effect is found after controlling for all observable morbidity indicators, related to age and to chronic illness. This "choice" of a common room is most probably an important explanatory factor for the relatively low supplements paid by these groups.

This finding raises important questions, which we cannot really answer with the available data. First, what is the relationship with supplemental hospital insurance? As will become clear in the next chapter, all these groups mentioned with a clear inclination of being taken up in a common room, have a lower probability of being covered by supplemental hospital insurance. Although one may wonder about the direction of causality here, one can reasonably formulate the hypothesis that the availability of supplemental hospital insurance coverage increases the chances of being taken up in a single room, and therefore the chances of having to pay large supplements. Second, we have no information on the quality of treatment for patients in different room types. If patients in one-person rooms are treated "better" (even if only in a purely subjective way), then we can also interpret the results in Table 20 as an indication of which groups get a "better" treatment in the hospital. Without more detailed (possibly survey) research, nothing can be said about this, however.

The regional effects in Table 20 are also very revealing. The lowest probabilities of getting a single or a two-person room are indeed found for the patients from Hainaut: this may significantly contribute to the lower supplements paid there. However, and more strikingly, the larger hospital supplements to be paid in Brussels, Brabant Wallon and Liège can not be explained by the room choice: citizens from each of these provinces have a lower probability than the reference (Antwerpen) of ending either in a single room or in a two-person room. If it is not the probability of being hospitalized (column 1), nor the choice of room (columns 2 and 3), the main burden of the explanation must fall on the price setting behaviour which has been discussed in the previous section. Overall, table 20 suggests that there may be a general regional effect with a lower number of common room stays in the Flemish provinces. This general pattern certainly does not coincide with the distribution of hospital supplements described before.

3. The choice of a private hospital (Table 20, column 4)

Let us finally look at the choice of a private hospital. Here as well, the observation level is that of a (inpatient) hospital stay. In our sample, about two thirds of the hospitalisations take place in a private hospital, and the remainder in a public hospital. Since this is again a choice between only two options, we can do with the binary logistic model that was already implemented in the first column of Table 20 and in Table 8. The results are given in the fourth column of Table 20.

It is immediately obvious that the number of significant odds effects is much smaller here than in the other cases and that their values are closer to 1. Personal characteristics seem to have a minor influence on the choice of hospital. The only reasonably strong effects are found for the socio-economic variables, related to residents (either with high or low incomes) and people who are entitled to a minimum income. They all have a lower probability of being taken up in a private hospital. In the light of what we have seen in the previous section, this may contribute to explaining their lower supplements. But the effect most probably will be rather weak.

We find strong effects for the regional dummies. The probability of being taken up in a private hospital is much larger for citizens from Vlaams Brabant and Brabant Wallon, larger for citizens from West-Vlaanderen and Oost-Vlaanderen, smaller for citizens from Namur and much smaller for citizens from Limburg and especially Liège and Luxembourg. In a certain sense, this confirms the hypothesis that personal characteristics play only a minor role here, and that the choice of hospital is in the first place determined by geographical distance. There is no straightforward connection between this geographical distribution and the regional differentiation in supplements. We can therefore hypothesize that the private/public distinction does not have important effects on the regional variation of supplements to be paid and that we should not pay much attention to it. We can also compare this with Table 18. In most provinces where the percentage of GP that do not accept the general tariffs is lower (higher) than in Antwerpen (the reference), we see that patients have a larger (smaller) chance of being hospitalized in a private hospital. The reverse is true for the specialist refusals.

Table 20: Determinants of hospital stay/choices for inpatient hospitalisation

	Determinants hospital stay	Determinants room choice (reference = common room)		Determinants choice private hospital
		Single room	2-person room	
Vl_Brab	**0.796**	**0.867**	**0.766**	**8.049**
W_Vl	**1.049**	**0.834**	**1.539**	**1.339**
O_Vl	0.986	0.983	1.022	**1.482**
Limburg	**0.932**	**0.772**	**0.638**	**0.498**
Brussels	**0.791**	**0.59**	**0.725**	**0.937**
Brab_W	**0.944**	**0.596**	**0.443**	**3.797**
Hainaut	**1.068**	**0.406**	**0.211**	**0.874**
Liège	1.013	**0.74**	**0.541**	**0.169**
Luxemb	**1.070**	**0.447**	**0.877**	**0.069**
Namur	1.014	**0.472**	**0.599**	**0.669**
M_0	**8.493**	**0.394**	**0.22**	**0.759**
M_1-4	**3.407**	**0.728**	**0.421**	0.998
M_5-9	**1.121**	**0.494**	**0.264**	**0.697**
M_10-14	0.978	**0.362**	**0.29**	**0.832**
M_15-19	**1.073**	**0.614**	0.942	**0.760**
M_20-24	**0.915**	**0.723**	0.916	**0.798**
M_25-29	**0.898**	**0.811**	1.037	**0.897**
M_35-39	**1.099**	0.923	1.005	**0.870**
M_40-44	**1.224**	0.973	1.067	**0.841**
M_45-49	**1.430**	**1.124**	**1.116**	0.979
M_50-54	**1.716**	**1.244**	**1.571**	0.977
M_55-59	**1.918**	**1.661**	**1.575**	**0.775**
M_60-64	**2.200**	**2.373**	**2.656**	**0.736**
M_65-69	**3.060**	**1.982**	**2.236**	**0.716**
M_70-74	**3.528**	**1.809**	**2.241**	**0.871**
M_75-79	**4.247**	**1.409**	**2.11**	**0.807**
M_80-84	**4.678**	**1.598**	**2.401**	**0.896**
M_85-89	**5.175**	**1.86**	**2.48**	**0.840**
M_90-94	**4.154**	**1.77**	**2.318**	**0.880**
M_95+	**5.660**	**2.398**	**1.734**	0.814
F_0	**7.293**	**0.371**	**0.206**	0.934
F_1-4	**2.834**	**0.892**	**0.367**	1.009
F_5-9	0.977	**0.557**	**0.511**	1.047
F_10-14	**0.743**	**0.523**	**0.68**	1.012
F_15-19	**1.526**	**0.533**	**0.794**	**0.710**
F_20-24	**2.028**	**1.564**	**1.178**	0.958
F_25-29	**4.001**	**4.057**	1.033	1.049
F_30-34	**3.483**	**4.31**	1.089	1.006
F_35-39	**2.059**	**2.601**	**1.185**	**0.891**
F_40-44	**1.603**	**1.789**	**1.808**	1.046
F_45-49	**1.633**	**1.694**	**1.718**	**0.802**
F_50-54	**1.737**	**1.999**	**2.008**	0.948
F_55-59	**1.857**	**2.69**	**2.628**	**0.897**
F_60-64	**2.177**	**3.1**	**2.791**	**0.872**
F_65-69	**2.585**	**2.494**	**2.706**	0.956

	Determinants hospital stay	Determinants room choice (reference = common room)		Determinants choice private hospital
F_70-74	**2.956**	**2.088**	**2.674**	**0.866**
F_75-79	**3.718**	**1.849**	**2.734**	**0.886**
F_80-84	**4.165**	**1.78**	**2.948**	**0.860**
F_85-89	**4.409**	**1.928**	**2.543**	**0.811**
F_90-94	**3.018**	**1.641**	**2.448**	**0.878**
F_95+	**2.899**	**1.463**	**2.033**	**0.677**
died_q1	**6.551**	**0.471**	**0.593**	**0.813**
died_q2	**8.911**	**0.643**	**0.709**	**1.086**
died_q3	**8.197**	**0.692**	**0.799**	1.000
died_q4	**11.182**	**0.634**	**0.718**	**0.828**
res_not lowY	**1.127**	**0.313**	**0.609**	**0.419**
res_lowY	**1.453**	**0.38**	**0.683**	**0.789**
inval_tit	**3.527**	**0.354**	**0.481**	**1.137**
inval_dep	**1.450**	**0.353**	**0.547**	**0.665**
handic_tit	**1.456**	**0.525**	**0.6**	**0.941**
handic_dep	**1.429**	**0.467**	**0.49**	**1.189**
retired	**1.463**	**0.551**	**0.798**	**1.059**
widow	**1.509**	**0.47**	**0.676**	1.000
orphan	**1.329**	**0.165**	0.817	1.142
self_empl	**0.925**	**1.908**	**1.827**	**1.223**
preftreat	**1.240**	**0.363**	**0.743**	1.012
unemployed	**1.122**	**0.429**	**0.662**	**0.931**
parttime	**0.779**	**0.668**	**0.573**	**0.890**
early_retired	**1.214**	**0.714**	**0.776**	**1.160**
nursing_pay_B	**3.023**	1.041	**0.9**	1.000
nursing_pay_C	**1.670**	**1.279**	**0.834**	1.062
phys_E	**1.915**	**1.133**	**1.063**	1.029
incr_child_ben	**2.876**	**1.474**	1.06	**1.118**
integr_handic	**1.253**	**0.757**	**0.822**	**0.893**
help_elderly	**1.262**	**0.733**	**0.882**	0.969
help_thirdparty	0.922	1.065	0.976	**0.834**
ben_invalidity	**0.846**	**2.093**	**2.02**	**1.193**
lumpsum_thirdparty	0.863	**0.323**	**1.236**	0.934
guarant_Y_-60	**1.366**	**0.361**	**0.467**	**0.634**
guarant_Y_+60	0.983	**0.919**	**0.893**	**0.915**
subsidy_handic	**1.353**	**0.693**	**0.887**	**1.078**
ben_unempl	**0.971**	**0.656**	**0.842**	0.960
work_incap	**7.818**	**0.811**	**1.081**	**0.948**

For the labeling of the variables, see appendix 3.

2.5.2 Wrapping up: the structure of supplements

Putting all the elements in the different tables together, we can now build up a more complete picture of the structural determinants of supplements. To summarise:

- some individuals are taken up in a hospital, others are not. The determinants of this decision are given in Table 20. These determinants mainly reflect morbidity and largely overlap with the effects described in the reduced form equations in Tables 7 and 12.
- there are some differences, however. Conditional on being taken up in a hospital, patients will be allocated over different types of room and have the possibility to opt for a private hospital (Table 20). These decisions reflect to some extent personal preferences (and the availability of a supplemental hospital insurance).
- the choice of room and (less so) of a private hospital has a significant effect on the own prices to be paid (Table 19). These additional effects have to be combined with the morbidity aspects to get a clearer understanding of some of the patterns that prevail in the reduced form estimates of Tables 7 and 12.

It is useful to be aware of the methodological caveat that was already hinted at before. We have estimated all these different components of the full structural model separately. Moreover, we have opted for a cavalier treatment of the resulting (self) selection problems. A fully satisfactory statistical analysis would require the full specification of the error structure (including the covariances between different equations) behind this structural model, and the use of sophisticated estimation techniques. As a matter of fact, we do not know any example in the literature where the complex combination of discrete choices at different levels as we describe it, has been fully specified and estimated. We do not think that the huge investment in techniques that would be needed would pay off in terms of interesting additional insights. It would definitely make the reading of the results much more difficult. Given the large number of observations at our disposal, we are confident that our most important findings are robust for this methodological simplification. Still, we readily admit that there is need for caution in interpreting our results in a causal way.

Let us, with this caveat in mind, illustrate the interpretation of the different models by two concrete examples. In each case, we will indicate how the combination of the results from different tables contributes to getting a more or less coherent picture.

1. the geographical distribution of supplements

To better understand the mechanisms explaining the geographical distribution of supplements, it is interesting to focus on two cases: Brussels and Hainaut. In the case of Brussels we have seen that:

- conditional on the other variables (mainly observable indicators of morbidity and economic fragility), average supplements are not higher in Brussels. However, patients living in Brussels have a larger probability of ending up in the category of extreme payers of supplements (> €1,000). The same is (more strongly) true for the hospital supplements.
- despite a larger percentage of doctors that do not abide by the general tariff agreement, "unit prices" for ambulatory supplements seem to be somewhat lower in Brussels, but the effect is weak. On the other hand, patients who have to pay ambulatory supplements on average pay a larger amount than the reference.
- patients from Brussels have a rather low chance of being taken up in an hospital and if they are taken up, they have a relatively larger probability of ending up in a common room.
- the price setting behaviour of hospitals in Brussels is significantly different from the behaviour of the largest part of the country. Supplements per stay are much larger in Brussels. This holds for different categories of supplements and in some cases it is even true for two-persons-rooms and common rooms.

Of course, not all patients from Brussels will be treated in hospitals in Brussels, but nevertheless the conclusion really suggests itself: if there are more extreme payers in Brussels, this is in the first place due to the price setting behaviour of the hospitals. The particularly skewed distribution of supplements in Brussels reflects the effects of hospitalisation on the supplements, including the indirect effect on ambulatory supplements.

In the case of Hainaut the picture is very different:

- average supplements are significantly lower in Hainaut than in Antwerpen. Moreover, Hainaut has a lower incidence of extreme payers.
- the unit supplements raised in the ambulatory sector are significantly lower in Hainaut. This may be linked to the small fraction of specialists who did not accept the general tariff agreement.
- patients from Hainaut have a larger than average probability of having a stay in the hospital. However, more than in any other province, these stays are concentrated in common rooms where the supplements to be paid are lower.
- there are no indications of differences in pricing behaviour between the hospitals in Hainaut and the reference province (Antwerpen).

Again, the story seems obvious. The lower supplements in Hainaut are caused by lower ambulatory supplements but more importantly by less extreme hospital supplements. This latter phenomenon does not reflect differential morbidity nor differential pricing behaviour of the hospitals, but is mainly explained by the dominance of stays in common rooms.

2. *what do we know about the position of the weaker socio-economic groups?*

Let us now in the same way bring together the results concerning the weaker socio-economic groups. To repeat, we are referring here to the residents at low income (res_lowY), the unemployed (unemployed, parttime, early_retired and ben_unempl), and the individuals who are entitled to a guaranteed minimum income (variables guarant_Y). As in the previous case, a simple summary of the relevant findings is sufficient to get a global picture:

- official reimbursements and global supplements to be paid do not differ between these groups and our reference group (of active males). Except for the residents at low income they even have a lower chance of being among the extreme payers.
- our data do not allow us to say anything about a possible underconsumption of health care by these groups. However, they have an almost equal probability as the reference group to be taken up in an hospital. This is in line with the finding that their health care reimbursements do not differ significantly.
- when they are taken up in the hospital, there is a very large probability that this is in a common room. This is one of the strongest effects in Table 20. Moreover, weaker economic groups also have a lower probability of a stay in a private (as compared to a public) hospital. Both effects - but especially room choice - will have a negative influence on the total amount of supplements to be paid. More specifically, they offer an attractive explanation for the relative absence of extreme supplements for these groups.
- we must be cautious in interpreting these results, since we do not have the necessary information to link the supplements paid to the income of the relevant groups. The same absolute amount will of course have a very different financial meaning depending on the purchasing power. The fact that there are no differences between these groups and the reference person may therefore also to some extent be seen as a worrying conclusion.
- another caveat refers to the overlap between these categories and those who have the right to preferential treatment. Preferential treatment appears as a separate controlling variable in all equations. Therefore, the effects of these socio-economic variables have to be interpreted as the effects which remain after having controlled for preferential treatment.

It is not difficult to tell similar stories for the other variables appearing in the different tables and discussed in the previous sections. More specifically, we will bring together our results on preferential treatment and on some groups of the chronically ill in the next section.

Key points

- **The geographical differentiation in hospital supplements cannot be explained by morbidity factors, but is in the first place related to differences in the price-setting behaviour of hospitals.**
- **There is a very strong social stratification in the choice of room. Those with preferential treatment and the weaker socio-economic groups do not go less often to a hospital, but if they are taken up they opt much less often for a single room. These differences in room choice are the most important explanation for the lower overall level of supplements to be paid by these groups.**

2.6 THE POSITION OF SPECIFIC SOCIAL GROUPS

Until now, we have focused on the overall distribution of supplements and on the pattern of regional variation. Although we have regularly spent some attention to the profile of high and extreme payers, we have emphasized that the available administrative data are not very well suited for a detailed analysis of the financial accessibility of the health care sector for the weaker groups in society. In this section we will nevertheless try to bring together some preliminary findings from that perspective. We will first summarise our results with respect to the system of preferential treatment. We will then focus on the effects of the supplements on some small (but socially important) groups of chronically ill. For this purpose we also make use of the data for 2002. We will finally return to the specific position of the self-employed in the Belgian system.

2.6.1 The effects of the system of preferential treatment

The Belgian system of health insurance offers special protection to patients with preferential treatment. As explained in the first chapter of this report, this special protection has been extended to the supplements. In fact, it is often proposed to further extend these protective measures to e.g. supplements for medical appliances.

Our findings with respect to the efficiency of the system of preferential treatment can be summarised as follows:

- individuals who are entitled to preferential treatment have significantly lower co-payments and larger reimbursements. This effect was to be expected, since there is necessarily a shift of the financial burden from the patient to society. With our data, we cannot distinguish this mechanical effect from the possible moral hazard effect, caused by the lowering of the co-payments.
- individuals with preferential treatment pay significantly lower supplements, both in the hospital and in the ambulatory sector. They have therefore a lower danger of ending up in the group of extreme payers.
- they have a slightly larger chance of being taken up in the hospital. Their stays in the hospital are on average longer than those of the reference person in the regressions. When being taken up, they stay much more often in a common room.

These results suggest that the system of preferential treatment succeeds in protecting to a large extent the concerned groups. At the same time, however, supplements may remain large for some individuals and, as mentioned before, we cannot correct the remaining financial burden for income differences. In fact, to understand better the implications of the regulation, it is useful to pursue somewhat further the comparison with other economically vulnerable groups, the situation of which has been described in the previous section (i.e. the residents with low income (res_lowY), the unemployed

(unemployed, parttime, early_retired and ben_unempl), and the individuals who are entitled to a guaranteed minimum income (variables guarant_Y)). As described before, we can interpret the coefficients for these variables as the relevant effects for those individuals who belong to these vulnerable groups without having a right to preferential treatment.

First, the latter do not have lower co-payments and lower supplements. Table 7 makes it possible to estimate the average joint effect of the regulation for preferential treatment as about €160 per year on average (€132 in co-payments, €27 in supplements). Table 12 estimates the effect on hospital supplements (for the non-zero observations) to be about €96. However, even this latter average does not sufficiently capture the right tail of the distribution, and we may expect the effects on the extreme supplements to be socially more relevant than is captured by these numbers.

Second, however, we have seen that most of these weaker socio-economic groups also have a lower chance than the reference individual to end up in the group of extreme payers. In that sense, they are similar to those on preferential treatment. This is partly due to the regulation on hospital supplements. Yet it also reflects the tendency for all these groups (as for those on preferential treatment) to opt for a common room, when staying in the hospital. This brings us to an interesting finding of this study.

When comparing the hospital supplements it turned out that the differences between the room types were more important than the differences according to preferential treatment. In fact, for each room type taken separately, there were almost no differences between patients with and without preferential treatment. While the effects of the regulation could clearly be detected in the regression equations for the "unit prices" (Table 19), these protective measures are counterbalanced by the longer length of the hospital stays of the patients with preferential treatment (Tables 14 and 15). The differences in the supplements paid are therefore very closely linked to the social stratification in the choice of room type (Tables 14 and 20).

This strong social stratification in the choice of room type may already as such be considered deplorable from a social point of view. Moreover, it raises tricky questions about the relative quality of the treatment in different room types. In fact, quality of treatment does extend beyond pure medical considerations. We have no indications of quality differences in our study, but more research could be useful here. Such more detailed research could also offer useful information for thinking about the design of the regulation, which is now structured along the dimensions of "room type" and "preferential treatment and other protected persons". It could make sense to distinguish more carefully between different types of costs. Relative "luxury" items should then become part of the personal financial burden of the patients whereas necessary items (such as medical appliances) should be financed by society. In both cases this should be independent of the type of room in which the stay takes place – and in some cases also independent of the social status of the patients. Finally, it is obvious that none of these questions can be answered in a fully satisfactory way without taking into account the differential coverage of different patients by supplemental hospital insurance. We will come back to this in the next chapter.

2.6.2 Supplements and the chronically ill (tables 21, 22, 23 and 24)

Special concerns can be raised with respect to the supplements to be paid by the chronically ill. Ideally, a study of this problem would require the use of diagnostic information in order to differentiate the supplements according to illnesses. Our data offer only limited possibilities in this respect (subsection 1). Additional insights can be obtained by looking at the results for the variables nursing_pay_B and nursing_pay_C that appeared in the previous tables. We summarise these in subsection 2. Finally, the most interesting information is obtained by combining the data for 2003 –that have been analysed in detail in this study- with the data for 2002. Subsection 3 discusses how this allows us to analyse the temporal persistence in the supplements.

Preliminary results for some specific illnesses

As mentioned before, our data do not contain any diagnostic information. Moreover, we do not dispose of the individual items of the nomenclature or of the prescribed medicines. These data limitations strongly reduce the possibility to define certain groups with a chronic pathology. We still could select three specific "pathology" groups (diabetes patients, dialysis patients and patients in psychiatric hospitals) according to the following procedure. From our data, we captured the diabetes patients by selecting all persons with positive ZIV-reimbursements for at least one of the following categories: patients enrolled in the RIZIV/INAMI convention, with insulin injections, a lump sum for a diabetes nurse or with a diabetes passport. We neglect the diabetes patients who can only be identified by means of prescribed medicines[sss]. The dialysis patients were identified as those patients with positive ZIV-reimbursements for medical fees for dialysis, haemodialysis at home, dialysis in a collective auto-dialysis centre, peritoneal dialysis at home, travelling expenses or a lump sum per hospitalisation day[ttt]. Patients in psychiatric hospitals were identified through the characteristics of the hospital and not through specific categories of ZIV-reimbursements. For this purpose we used the database at the level of the hospital.

Table 21 gives for the total population and for each of the three illness groups the percentage of observations with positive supplements and the mean supplements. We only show the results for total supplements, hospital supplements and ambulatory supplements. The number of patients in the specific groups is too small to give reliable results for the subcategories of supplements. For the same reason, and contrary to the approach in most of the previous sections, we do not control for personal or hospital characteristics.

When compared to the total population, the differences between the percentage of observations with positive supplements and the mean are relatively small for the diabetes patients. They certainly pay higher average supplements in the hospital sector, but in the ambulatory sector this difference is much less pronounced. For the dialysis patients, supplements are substantially higher, both in the hospital and ambulatory sector. In fact, the average dialysis patient belongs to the group of "high" payers (with supplements >€500).

For the psychiatric patients the unit of observation is not the individual but the hospital stay. This makes it difficult to compare the result in the fourth column with the numbers in the first column (which refer to the individual). Since we restricted the sample to inpatient hospitalisations, we neglect the ambulatory supplements. When compared to Table 13, it turns out that average hospital supplements per stay for psychiatric patients are somewhat larger than for the overall population. However, from Table 19 we learned that while fee supplements are slightly larger, room supplements per day are significantly smaller in psychiatric hospitals. As Table 22 shows, the explanation for the larger supplements per stay cannot be found in the choice of room: psychiatric stays are predominantly in common rooms. However, as also shown in Table 22, the average length of stay in a psychiatric hospital is almost ten times that of a stay in an acute hospital and more than four times that of a stay in a chronic hospital. Length of stay is therefore most probably the most important factor to explain the larger supplements per stay for psychiatric patients.

[sss] According to Ceuppens, et al., 2005[13] there were about 250,000 diabetes patients in Belgium in 2002. We identified only 153,500 of them.

[ttt] We identified 11,020 dialysis patients. We did not find any comparable data for the Belgian population. According to NBVN, 2004[14], the number of patients in Flanders was equal to 3,154 in 2003.

Supplements for those who are entitled to lump sum B or C for nursing care

Patients who are entitled to lump sum B or C for nursing care definitely can be categorized as chronically ill. The results obtained for these groups can be summarised as follows:

- table 7 shows, not surprisingly, that chronic illness leads to a very strong increase in health care reimbursements (in the order of €8,000-€10,000). It also increases co-payments (around €350) and supplements (around €150). Moreover, these are spread rather evenly over the whole group (compare columns 3 and 4 in Table 7). Of course, the chronically ill also have a larger probability of belonging to the extreme payers (Table 8).
- they pay larger supplements in the ambulatory sector. Especially for the nursing_pay_C, drugs constitute a relatively large part of that burden. It is striking that the relative importance of drugs also returns in the hospital supplements.
- the chronically ill have a larger than average probability of being taken up in a hospital. Their choice of room type is not very different from that of the reference person. It is not surprising therefore that they also pay larger than average room supplements.

Of course we cannot neglect the fact that the amount of the lump sum subsidy itself should (perhaps) be subtracted from the OOP-payments of the chronically ill. The results in Table 7 suggest, however, that this subsidy on average is not sufficient to cover the sum of additional co-payments and supplements. Comparing these findings to the ones obtained for preferential treatment, we can at least formulate as a reasonable hypothesis that the protection of the chronically ill is less efficient.

The persistence of supplements over time

Supplements can become a considerable personal cost, even if they occur only once (e.g. on the occasion of a hospital admission). However, from a financial point of view, things get much worse for patients when these costs become recurrent. If the payment of large supplements is persistent over time, this is in itself an indicator of chronic illness. We can try to measure this persistence over time by combining the data for 2003 with those of 2002. We will not focus on the overall pattern of the supplements for 2002, which is anyway very similar to the one for 2003. We will rather concentrate on the correlation between the two years.

It is of course well known that there is a strong correlation between health care expenditures over different years. Simple regressions of the data for 2003 on those of 2002 confirm this hypothesis:

ZIV-expenditures 2003	=579.37 + 0.72 (ZIV-expenditures 2002) (6.89) (0.002)	R^2 =0.37
co-payments 2003	=57.50 + 0.69 (co-payments 2002) (0.46) (0.002)	R^2 =0.41
supplements 2003	=50.17 + 0.21 (supplements 2002) (0.72) (0.002)	R^2 =0.03

Comparing the statistical performance of these primitive regressions with the one of the complete demographic model, as summarised in Table 7, immediately shows that expenditures in year t-1 are a better predictor for expenditures in year t than the whole long list of demographic and morbidity variables which were taken up in Table 7. At the same time (and also in line with what was found before) the unexplained part in the variation of supplements is much larger than for the other components of health care expenditures. While this may be partly due to the changes in regulation that have

been introduced at the end of 2002, the finding of a large degree of unexplained variation in the supplements is also one of the common findings in this study.

To get a better insight into the persistence of supplements over time, it is worthwhile to look in more detail at the intertemporal correlation of supplements. This is shown in some detail in Table 23 – which has to be interpreted in the same way as Tables 4-6[uuu]. This table suggests that there is indeed strong correlation over time. This can be seen by comparing the column percentages in the columns coloured yellow or brown (people paying high supplements in 2003) with the corresponding percentages in the column of the totals. Of the 135,520 extreme payers (more than €1,000) in 2003, 11.8 % (16,020 individuals) also paid more than €1,000 in 2002. And the correlation remains if we go to the very large amounts: of the 6,520 individuals who had to pay more than €5,000 of supplements in 2003, 5.5% (360) individuals were already in the same situation in 2002. Looking at the first row, 23.62% of those paying more than €5,000 in 2003, paid no supplements at all in 2002. This is less than half of the overall percentage of individuals paying no supplements in 2002, which is 54.81%. The intertemporal correlation of supplements indeed seems to be high.

This intertemporal correlation leads to a situation in which a non-negligible fraction of the population has to pay large amounts of supplements in successive years. As stated before, 16,020 individuals can be called persistently extreme payers, in that they had to pay more than €1,000 in supplements both in 2002 and in 2003. Moreover, 40,820 individuals had to pay more than €500 in supplements both in 2002 and in 2003 and can therefore be seen as persistently high payers.

As we have seen before, supplements are highly linked to hospitalisations. Persistence of supplements may therefore be due to some extent to repeated hospitalisations. In fact, of the 1,048,940 individuals that have been hospitalized in 2003 (11.7%), almost one third (308,240 individuals) also had been hospitalized in 2002. Moreover, remember that there is also a link between hospitalisation and ambulatory supplements. More in general, it seems obvious that many of those who are hospitalized in 2003 will already have been in a worse health situation before. This becomes clear in Table 24, where we show how ZIV-expenditures, co-payments and supplements in 2002 differ between those individuals who have been hospitalized in 2003 and those who have not been hospitalized.

It is clear that for those who have to pay large amounts of supplements in two (or more) consecutive years the financial consequences can be quite dramatic. Moreover, the figures in Table 23 only refer to supplements. To calculate the total out-of-pocket payments for these people, we should also take into account the co-payments. As was shown in section 1, high supplements often go together with high co-payments.

Table 21: Supplements for diabetes patients, dialysis patients and patients in psychiatric hospitals

		Total population	Diabetes patients	Dialysis patients	Patients in psychiatric hospital
Total	% obs positive suppl	42.07	52.85	93.10	
	Mean	151.18	294.73	826.91	
Total_h	% obs positive suppl	21.28	41.59	88.02	58.44
	Mean	267.15	350.61	844.80	344.33
Total_a	% obs positive suppl	29.92	25.59	39.56	
	Mean	30.40	38.94	67.31	

For the labeling of the variables, see appendix 3.

[uuu] Note that the data for the supplements in 2003 are slightly different in the Tables 4-6 and 23. The reason is that the latter table only relates to the individuals that are available in the data set in both years 2002 and 2003. The former tables contain the data for all individuals that are in the data for 2003. The two data sets obviously differ because of births, deaths and migration.

Table 22: Room choice and length of stay for psychiatric stays in comparison to acute and chronic stays

	PZ			AZ			CZ		
	N	% room	mean days	N	% room	mean days	N	% room	mean days
oom_1p	5,040	8.11	93.29	298,880	20.41	7.83	16,480	27.46	16.20
oom_2p	1,960	3.16	70.54	291,620	19.92	8.91	9,760	16.26	20.66
oom_+2p	53,920	86.80	81.69	791,700	54.07	9.09	30,860	51.42	22.17
oom_un	1,200	1.93	73.30	82,100	5.61	7.21	2,920	4.87	19.72
Total	62,120	100	82.12	1,464,300	100	8.69	60,020	100	20.16

For the labeling of the variables, see appendix 3.

Table 23: Joint distribution of supplements in 2002 and 2003

Supplements 2002	Frequency / Percent / Row Pct / Col Pct	supplements 2003														
		0	0-5	5-10	10-20	20-50	50-100	100-250	250-500	500-750	750-1000	1000-2000	2000-3000	3000-4000	4000-5000	>5000
0		3872820	303200	123260	136260	161460	78840	88600	53220	32440	21840	30260	9820	2800	1620	1540
		43.16	3.38	1.37	1.52	1.8	0.88	0.99	0.59	0.36	0.24	0.34	0.11	0.03	0.02	0.02
		78.75	6.17	2.51	2.77	3.28	1.6	1.8	1.08	0.66	0.44	0.62	0.2	0.06	0.03	0.03
		72.35	25.54	28.64	29.52	29.75	29.33	32.21	33.04	33.97	35.54	34.36	35.66	30.3	38.94	23.62
0-5		681700	523280	128560	114240	116140	50260	44220	27000	16740	8980	11880	3340	860	260	540
		7.6	5.83	1.43	1.27	1.29	0.56	0.49	0.3	0.19	0.1	0.13	0.04	0.01	0	0.01
		39.45	30.28	7.44	6.61	6.72	2.91	2.56	1.56	0.97	0.52	0.69	0.19	0.05	0.02	0.03
		12.73	44.08	29.87	24.75	21.4	18.7	16.07	16.76	17.53	14.61	13.49	12.13	9.31	6.25	8.28
5-10		150940	87580	46600	40420	40140	16520	15260	8440	5700	3940	4380	1000	360	160	520
		1.68	0.98	0.52	0.45	0.45	0.18	0.17	0.09	0.06	0.04	0.05	0.01	0	0	0.01
		35.77	20.76	11.04	9.58	9.51	3.92	3.62	2	1.35	0.93	1.04	0.24	0.09	0.04	0.12
		2.82	7.38	10.83	8.76	7.4	6.14	5.55	5.24	5.97	6.41	4.97	3.63	3.9	3.85	7.98
10-20		157540	83000	40820	51880	51340	20820	18520	9840	5740	4240	5640	1560	640	200	380
		1.76	0.93	0.45	0.58	0.57	0.23	0.21	0.11	0.06	0.05	0.06	0.02	0.01	0	0
		34.84	18.36	9.03	11.47	11.35	4.6	4.1	2.18	1.27	0.94	1.25	0.35	0.14	0.04	0.08
		2.94	6.99	9.49	11.24	9.46	7.74	6.73	6.11	6.01	6.9	6.4	5.66	6.93	4.81	5.83
20-50		175860	78300	39720	52780	76280	34840	27060	14460	8580	5840	8300	2240	1140	340	420
		1.96	0.87	0.44	0.59	0.85	0.39	0.3	0.16	0.1	0.07	0.09	0.02	0.01	0	0
		33.42	14.88	7.55	10.03	14.5	6.62	5.14	2.75	1.63	1.11	1.58	0.43	0.22	0.06	0.08
		3.29	6.6	9.23	11.44	14.06	12.96	9.84	8.98	8.98	9.5	9.43	8.13	12.34	8.17	6.44
50-100		85380	36620	16120	21220	34160	23060	20980	10060	5580	3260	3940	1500	280	120	380
		0.95	0.41	0.18	0.24	0.38	0.26	0.23	0.11	0.06	0.04	0.04	0.02	0	0	0
		32.51	13.94	6.14	8.08	13.01	8.78	7.99	3.83	2.12	1.24	1.5	0.57	0.11	0.05	0.14
		1.59	3.08	3.75	4.6	6.3	8.58	7.63	6.25	5.84	5.3	4.47	5.45	3.03	2.88	5.83
100-250		85720	29860	14480	17840	27480	20300	28880	13720	5760	3820	5980	1460	720	160	460
		0.96	0.33	0.16	0.2	0.31	0.23	0.32	0.15	0.06	0.04	0.07	0.02	0.01	0	0.01
		33.4	11.63	5.64	6.95	10.71	7.91	11.25	5.35	2.24	1.49	2.33	0.57	0.28	0.06	0.18
		1.6	2.52	3.36	3.87	5.06	7.55	10.5	8.52	6.03	6.22	6.79	5.3	7.79	3.85	7.06
250-500		52440	18940	7600	9540	14160	9820	13660	11780	4800	2800	4020	1400	380	300	300
		0.58	0.21	0.08	0.11	0.16	0.11	0.15	0.13	0.05	0.03	0.04	0.02	0	0	0
		34.51	12.47	5	6.28	9.32	6.46	8.99	7.75	3.16	1.84	2.65	0.92	0.25	0.2	0.2
		0.98	1.6	1.77	2.07	2.61	3.65	4.97	7.31	5.03	4.56	4.57	5.08	4.11	7.21	4.6
500-750		32340	10700	5000	5760	7880	5120	6360	4660	4000	2220	2560	940	240	120	300
		0.36	0.12	0.06	0.06	0.09	0.06	0.07	0.05	0.04	0.02	0.03	0.01	0	0	0
		36.67	12.13	5.67	6.53	8.93	5.8	7.21	5.28	4.54	2.52	2.9	1.07	0.27	0.14	0.34
		0.6	0.9	1.16	1.25	1.45	1.9	2.31	2.89	4.19	3.61	2.91	3.41	2.6	2.88	4.6
750-1000		20800	5140	2680	3880	4380	2880	3620	2600	2140	1580	2420	700	280	80	260
		0.23	0.06	0.03	0.04	0.05	0.03	0.04	0.03	0.02	0.02	0.03	0.01	0	0	0
		38.92	9.62	5.01	7.26	8.2	5.39	6.77	4.87	4	2.96	4.53	1.31	0.52	0.15	0.49
		0.39	0.43	0.62	0.84	0.81	1.07	1.32	1.61	2.24	2.57	2.75	2.54	3.03	1.92	3.99
1000-2000		26780	7140	3920	5020	6380	4420	5240	3120	2320	1700	5920	1520	420	300	400
		0.3	0.08	0.04	0.06	0.07	0.05	0.06	0.03	0.03	0.02	0.07	0.02	0	0	0
		35.9	9.57	5.25	6.73	8.55	5.92	7.02	4.18	3.11	2.28	7.94	2.04	0.56	0.4	0.54
		0.5	0.6	0.91	1.09	1.18	1.64	1.9	1.94	2.43	2.77	6.72	5.52	4.55	7.21	6.13
2000-3000		6640	2040	1000	1600	1620	1120	1680	1360	920	740	1380	1340	360	280	420
		0.07	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0	0	0
		29.51	9.07	4.44	7.11	7.2	4.98	7.47	6.04	4.09	3.29	6.13	5.96	1.6	1.24	1.87
		0.12	0.17	0.23	0.35	0.3	0.42	0.61	0.84	0.96	1.2	1.57	4.87	3.9	6.73	6.44
3000-4000		2000	640	320	460	700	480	520	460	360	240	600	280	380	60	40
		0.02	0.01	0	0.01	0.01	0.01	0.01	0.01	0	0	0.01	0	0	0	0
		26.53	8.49	4.24	6.1	9.28	6.37	6.9	6.1	4.77	3.18	7.96	3.71	5.04	0.8	0.53
		0.04	0.05	0.07	0.1	0.13	0.18	0.19	0.29	0.38	0.39	0.68	1.02	4.11	1.44	0.61
4000-5000		1040	400	120	360	140	140	160	220	160	80	260	120	240	100	200
		0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		27.81	10.7	3.21	9.63	3.74	3.74	4.28	5.88	4.28	2.14	6.95	3.21	6.42	2.67	5.35
		0.02	0.03	0.03	0.08	0.03	0.05	0.06	0.14	0.17	0.13	0.3	0.44	2.6	2.4	3.07
>5000		1180	220	160	260	380	220	340	120	260	180	520	320	140	60	360
		0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0
		25	4.66	3.39	5.51	8.05	4.66	7.2	2.54	5.51	3.81	11.02	6.78	2.97	1.27	7.63
		0.02	0.02	0.04	0.06	0.07	0.08	0.12	0.07	0.27	0.29	0.59	1.16	1.52	1.44	5.52
Total		5353180	1187060	430360	461520	542640	268840	275100	161060	95500	61460	88060	27540	9240	4160	6520
		59.66	13.23	4.8	5.14	6.05	3	3.07	1.8	1.06	0.69	0.98	0.31	0.1	0.05	0.07

Table 24: Health care expenditures in 2002, differentiated according to hospitalisation status in 2003

Hospitalized in 2003	N	Variable	Mean
no	229,834	Reimbursements 2003	697.41
		Reimbursements 2002	897.78
		Co-payments 2003	109.36
		Co-payments 2002	122.53
		Supplements 2003	12.03
		Supplements 2003	41.64
yes	35,587	Reimbursements 2003	7,084.41
		Reimbursements 2002	3,486.35
		Co-payments 2003	524.60
		Co-payments 2002	312.81
		Supplements 2003	433.58
		Supplements 2002	140.85

2.6.3 The position of the self-employed (tables 25, 26, 27 and 28)[vvv]

Until now, we have omitted from all our analyses the self-employed without right to reimbursement of small risks in the compulsory system. Indeed, for this group we do not have any information about their expenditures for small risks. While, roughly speaking, most ambulatory treatment coincides with small risks and hospital treatment with large risks, the aggregation level of our data does not permit us to make a fine distinction between 'small risks' and 'large risks' (for which the insurance cover of the self-employed is similar to the one of the study sample in the previous part of our report). This means that we crucially underestimate the out-of-pocket payments of the self-employed. Moreover, as we mentioned before, including the self-employed (without insurance for small risks in the compulsory system) in the analysis could have really biased some of our interpretations since the interpretation of a "lower" amount of supplements (or co-payments) as a "smaller" threat to equality of access, would in their case be extremely misleading.

Table 25 gives some information on the supplements (column 1) and co-payments (column 3) paid by the self-employed and on the reimbursements (column 5) by the ZIV for the large risks according to the different categories of care. Columns 2, 4 and 6 compare these figures to those obtained for our general sample in Table 9. Some interesting points can be observed:

- our data suggest that self-employed pay on average only €3.9 supplements on ambulatory care (see the first figure in column 3); this is only 44.6% of what our general sample on average pays for this category. Of course, this is definitely a very serious underestimate, since our data do not include the out-of-pocket payments for small risks.
- self-employed pay on average about €52 of supplements. This is only 85% of the amount in the general sample. This difference is not only due to the ambulatory sector. The supplements paid for the inpatient categories are in general also lower, although here the differences with the general sample are smaller.
- the differences with the general sample become larger when we look at co-payments and reimbursements. Co-payments amount to €35 or only 22.3% of what the general sample pays. Reimbursements amount to €511 or 35.6% of what the ZIV pays for the persons in the general

[vvv] From a policy point of view, this analysis of the situation of the self-employed has become less relevant, since the decision has been taken to include all of them in the compulsory system in the near future.

sample. In contrast to the supplements, differences remain very large for the inpatient categories as well. Reimbursements for hospital treatment are only 56% of those in the general sample. Co-payments are only 51%. Supplements are therefore relatively more important than for the general population.

The interpretation of these tables requires some caution, however. They only show direct comparisons without controlling for any covariates (such as age and place of residence). Yet they certainly suggest that health care expenditures for the self-employed are lower. In theory, this could be due to the fact that they face a problem of accessibility of treatment and that they therefore consume less care in general and less hospital treatment in particular. This is not very probable, however. A more plausible hypothesis is that the self-employed are in better health and therefore consume less care. It is indeed possible that people in worse health will to a lesser extent opt for a job as self-employed. A third hypothesis (and probably the most convincing one) ascribes the differences in expenditures to behavioural differences.

Additional information on the behaviour of the self-employed and on the supplements they have to pay can be obtained by looking at the data per hospital stay (Table 26). Co-payments and reimbursements per stay are generally lower for the self-employed. At the same time, supplements are on average almost 50% higher. Fee supplements, room supplements and supplements of implants not reimbursed within the nomenclature are strikingly higher. This result is even more striking when we confront it with the information on length of stay in Table 27. A comparison with the corresponding Table 15 for the general sample shows that stays for the self-employed are much shorter. This is especially true for those with preferential treatment. These differences in length of stay are reflected in the results per day, which are shown in Table 26. Supplements per day for the self-employed are almost the double of supplements per day for the general sample – and co-payments and ZIV-reimbursements per day are also larger for the self-employed.

The main cause of the large supplements can be derived from Table 28 which differentiates supplements and co-payments according to preferential treatment status and room type. Table 28 is comparable to Table 14. There are large differences in supplements according to room type. Co-payments do not differ much according to room type, but are much lower for self-employed with preferential treatment, except for stays in unknown room type. When comparing the self-employed with the general sample, it turns out that supplements per stay in a private room are somewhat smaller for the self-employed, while supplements per stay in the other room types are larger. The differences are not very outspoken, however. The main explanation for the difference in the overall average supplement is to be found in the differences with respect to room choice. A far higher percentage of the self-employed choose treatment in a single room: respectively 39% and 15% of the self-employed without and with preferential treatment (in comparison to 25% and 8% for the general sample without and with preferential treatment).

These different room choices are only part of the story, however. The shorter length of stay of the self-employed is also reflected in the supplements per day. Even after controlling for the choice of room, it remains true that supplements per day are much larger for the self-employed than for the general sample. At the same time, the co-payments per day are very similar.

From our data, we have no indications that the self-employed are vulnerable because of a great need of medical treatment. They consume on average less medical care and therefore have to pay lower co-payments. On the other hand, it seems that there are behavioural differences causing them to pay relatively higher supplements. However, taking into account the fact that in our database we do not observe their out-of-pocket payments for small risks, we can not draw any final conclusions on their total payments.

Table 25: Supplements, co-payments and reimbursements for the self-employed for subcategories of expenditures and in proportion to the general sample (individual level)

	supplements		co-payments		reimbursements	
category	means	% of 'others'	means	% of 'others'	means	% of 'others'
total_a	*3.94*	*44.58*	*19.69*	*15.53*	*206.22*	*23.01*
medical fee_h	5.44	106.16	2.55	57.05	43.33	53.99
surgical fee_h	13.45	122.05	0.01	61.72	36.01	76.40
physio fee_h	0.02	48.25	0.07	5.80	0.16	4.41
gynaec fee_h	2.87	104.73	0.00	0.00	3.56	76.95
radio fee_h	1.06	104.07	0.54	69.33	15.94	59.50
drugs_h	2.96	63.58	0.51	35.45	33.93	68.80
impl28_h	1.78	73.70	0.11	76.90	6.35	64.41
impl35_h	0.88	58.91	0.06	28.18	8.13	49.75
impl35bis_h	0.07	43.33	0.25	28.27	4.19	77.76
implnon-reimb_h	1.81	102.37	0.00		0.00	
delivery impl_h	0.00		1.61	67.65	0.00	
nursing day_h	10.68	87.70	8.99	50.56	144.19	51.77
divcost_h	6.20	75.22	0.00		0.00	
paramedical_h	0.49	59.68	0.00		0.00	
clinical fee_h	0.22	83.76	0.62	73.29	8.25	53.91
other_h	0.02	54.59	0.01	14.61	1.50	29.54
total_h	*47.94*	*92.25*	*15.34*	*50.66*	*305.53*	*56.34*
total	*51.87*	*98.71*	*35.04*	*22.30*	*511.75*	*35.58*

For the labeling of the variables, see appendix 3.

Table 26: Supplements, co-payments and reimbursements for the self-employed for subcategories of expenditures and in proportion to the general sample (level of hospital stay)

		REIMBURSEMENTS				SUPPLEMENTS				CO-PAYMENTS				SUPPLEMENTS		
Category	**N**	**mean per stay**	**% of others**	**mean per day**	**% of others**	**mean per stay**	**% of others**	**mean per day**	**% of others**	**mean per stay**	**% of others**	**mean per day**	**% of others**	**N > 0**	**mean per stay > 0**	**mean per day > 0**
medical fee_h	2,986	358.53	84.54	69.06	105.43	47.41	167.57	11.26	210.62	18.01	85.00	4.39	120.73	723	191.53	45.48
surgical fee_h	2,986	313.50	120.82	71.63	141.71	119.99	191.94	33.54	231.94	0.11	98.81	0.11	539.20	583	569.12	159.09
physio fee_h	2,986	1.46	6.83	0.18	13.29	0.17	77.48	0.03	123.49	0.64	9.01	0.11	20.83	12	34.05	5.99
gynaec fee_h	2,986	32.08	122.17	7.15	123.69	26.11	165.74	5.53	167.35	0.00	0.00	0.00	0.00	174	357.97	75.80
radio fee_h	2,986	113.32	93.77	32.12	121.30	8.64	164.00	2.47	231.07	3.09	114.23	1.20	136.34	489	52.12	14.88
drugs_h	2,986	281.70	109.79	37.13	126.83	24.42	100.82	4.35	127.67	4.63	57.66	0.60	86.07	2,364	31.40	5.59
impl28_h	2,986	54.21	100.60	8.84	115.45	14.59	112.20	3.25	133.89	1.02	133.02	0.19	185.61	247	184.69	41.17
impl35_h	2,986	66.34	77.89	17.84	93.96	5.03	107.13	0.88	113.89	0.32	36.37	0.07	21.80	86	230.94	40.58
impl35bis_h	2,986	26.88	107.65	8.54	124.94	0.33	61.09	0.07	43.63	0.82	34.43	0.32	41.69	12	96.97	21.32
implnon-reimb_h	2,986	0.00		0.00		13.20	163.38	5.44	213.66	0.00		0.00		135	289.97	119.49
delivery impl_h	2,986	0.00		0.00		0.00		0.00		12.58	109.56	3.09	123.93			
nursing day_h	2,986	1,121.88	80.22	188.37	110.25	97.11	139.44	15.91	176.36	82.93	81.70	16.62	122.07	1,641	176.53	28.92
divcost_h	2,986	0.00		0.00		27.87	109.53	7.69	168.82	0.00		0.00		1,678	50.47	13.93
paramedical_h	2,986	0.00		0.00		2.34	89.69	0.64	128.89	0.00		0.00		304	23.62	6.41
clinical fee_h	2,986	53.60	83.78	14.22	111.28	1.83	136.18	0.33	157.94	3.55	120.17	1.39	142.43	196	26.51	4.71
other_h	2,986	13.72	49.93	1.17	41.47	0.14	87.73	0.02	114.45	0.07	20.55	0.02	77.54	9	38.71	6.13
total_h		*2,437.20*	*88.22*	*456.24*	*114.39*	*389.18*	*148.66*	*91.41*	*191.13*	*127.76*	*80.12*	*28.10*	*116.81*			

For the labeling of the variables, see appendix 3.

Table 27: Length of hospital stays for the self-employed

Room	pref treat	N	days
room_1p	0	907	6.67
room_1p	1	95	11.94
room_2p	0	488	6.21
room_2p	1	230	12.04
room_+2p	0	865	7.25
room_+2p	1	316	14.47
room_un	0	65	2.72
room_un	1	20	4.52
all	0	2,325	6.70
all	1	661	12.95

For the labeling of the variables, see appendix 3.

Table 28: Supplements and co-payments for the self-employed, according to room type and preferential insurance and in comparison with the general sample

Room	pref treat	N	%room	Supp per stay	Co-pay per stay	Supp per day	Co-pay per day
room_1p	0	31,100	39.28	814.50	142.95	195.00	30.88
room_1p	1	1,960	14.52	991.92	86.24	130.80	9.02
room_2p	0	15,860	20.03	262.89	140.87	73.19	33.68
room_2p	1	4,660	34.52	305.53	94.46	34.68	11.88
room_+2p	0	30,240	38.19	87.92	129.87	25.97	31.84
room_+2p	1	6,460	47.85	90.45	103.29	14.19	10.73
room_un	0	1,980	2.50	42.42	37.97	30.18	15.33
room_un	1	420	3.11	46.14	46.71	44.15	20.51
all	0	79,180	100.00	407.21	134.91	101.92	31.42
all	1	13,500	100.00	294.19	96.00	39.13	11.19

For the labeling of the variables, see appendix 3.

Key points

- **Some groups of chronically ill (e.g. the patients on dialysis) have to pay large supplements. This finding also applies to psychiatric patients who end up with larger supplements because of their much longer average length of stay in the hospital.**
- **Supplements are correlated over time. A non-negligible fraction of the population had to pay large amounts of supplements in two consecutive years: about 41,000 patients had to pay more than €500 in supplements both in 2002 and 2003, about 16,000 patients more than €1,000. Of the one million individuals that have been hospitalized in 2003, almost one third have also been hospitalized in 2002.**
- **The self-employed on average consume less medical care, but they pay larger supplements per hospital stay. Not only do they opt more often for a single room, they also pay larger supplements per day.**

3 SUPPLEMENTAL HOSPITAL INSURANCE AND OUT-OF-POCKET PAYMENTS

3.1 INTRODUCTION

In the previous chapter, we have analysed the IMA-data assuming that every person has to pay herself the total amount of her out-of-pocket payments (i.e. the sum of co-payments and supplements). In practice, some individuals buy supplemental health insurance which can reduce the amount of out-of-pocket-payments considerably. In Belgium, this supplemental hospital insurance is directed mainly towards hospital expenditures. Taking account of supplemental hospital insurance might alter some of our findings in the previous chapter. For instance, the distribution of out-of-pocket payments in the population (Figure 3) would be more left-skewed with relatively less high amounts. Moreover, some of the effects we have attributed in chapter 2 to personal characteristics could also be determined by whether individuals have purchased supplemental hospital insurance or not. For example, room choice in a hospital is probably influenced by having supplemental hospital insurance or not. We have stressed at several instances that the IMA-data do not contain information on supplemental hospital insurance. In this chapter we will therefore try to introduce some information from other sources to get a first insight into the determinants and consequences of supplemental hospital insurance.

In section 3.2, we summarize some results on the determinants of supplemental hospital insurance that are relevant for the Belgian context.

This sets the scene for section 3.3 where we analyse the Health Interview Survey 2001 (further: HIS 2001). The HIS 2001 includes information on supplemental hospital insurance. This information is combined with demographic, socio-economic, health and regional information to get some insights into the determinants of supplemental hospital insurance.

In section 3.4, we re-estimate the determinants of supplemental hospital insurance in Belgium using the HIS 2001, but restrict the determinants to those variables that are also available in the IMA data.

In section 3.5, we then analyse the effect of supplemental hospital insurance upon the distribution of out-of-pocket payments. We follow two procedures. First, we use the estimates from section 3.4 to impute in the IMA-data who has taken out supplemental hospital insurance. Second (and because our approach to impute supplemental hospital insurance based on HIS 2001 is not ideal), we compare the results with an alternative approach. In this approach we assume that all individuals residing in a one-person room have supplemental hospital insurance and that supplemental hospital insurance is randomly distributed in the remainder of the population.

3.2 SOME RELEVANT INSIGHTS FROM THE LITERATURE

The Belgian supplemental hospital insurance is a voluntary insurance contract that insures against out-of-pocket payments in hospital care and against some hospitalisation-related out-of-pocket payments in ambulatory care. Supplemental hospital insurance takes the form of individual contracts offered by sickness funds and private insurers, or employer-provided group insurance contracts.

The take-up of supplemental hospital insurance in Belgium is analysed by Berghman et al., 2005[15]. These authors found that the number of supplemental hospital insurance policies (both private and employer-provided) has increased considerably in the nineties. The authors also analysed the HIS 2001. We shortly summarize their findings, which can be compared with the results in section 3.3.2. First, they find that individuals between 45 and 65 are most likely to have supplemental hospital insurance. After the age of 65, insurance take-up is lower. According to the authors this might be attributed to higher insurance premiums and exclusion restrictions. Second, higher educated and richer individuals have a higher insurance take-up rate. Third, larger households are more

likely to have supplemental hospital insurance. Fourth, insurance take-up is lower in Brussels and the Walloons.

The authors also analysed the Salary Survey 2002 which includes information on employer-provided supplemental hospital insurance policies only. The findings were in line with those of the HIS 2001. It was further found that individuals working in large companies, with a long-term employment contract, working in telecommunication, ICT and the financial sector are more likely to have supplemental hospital insurance. Individuals working in the health care sector, the cultural sector, and education are less likely to have supplemental hospital insurance.

There is a large amount of literature on the take-up of voluntary health insurance in other countries. However, it is dangerous to translate the findings of these studies too literally to Belgium since the coverage of insurance, and the institutional context in which voluntary health insurance markets operate matter a great deal. In fact, in most European countries voluntary health insurance has a more prominent role in total health insurance than it has in Belgium. Nevertheless, two articles should be mentioned because they contain findings which may be relevant for our own empirical analysis.

Harmon et al., 2001[16] have analysed the determinants of voluntary health insurance in Ireland. In Ireland, public health insurance has nowadays a relatively broad coverage with respect to hospital care, while at the same time voluntary health insurance primarily provides cover for private inpatient care. The authors used the 1994 wave of the European Community Household Panel (ECHP) and a 1999 telephone survey carried out by the Irish Economic and Social Research Institute to analyse why individuals in this situation still buy private insurance. Using the latter survey, they found that perceptions about waiting times and quality of care matter. In so far as room choice in Belgium is related to (perceived) quality differences (see before), this is a relevant finding for the Belgian setting. Using the ECHP, Harmon et al., 2001[16] found that voluntary health insurance uptake is highest among middle aged individuals with a higher education, a higher income, married couples, and smaller households. With respect to health status it was found that low health is correlated with a lower voluntary health insurance uptake. This finding suggests that self/adverse-selection – if any – is not health-related, although it could equally well be the result of the limited number of (broadly defined) health indicators used by the authors. Alternatively, low voluntary health insurance uptake among low health individuals might result from behaviour of insurance companies.

Shmueli, 2001[17] has illustrated the importance of the latter effect using Israeli data. In Israel, voluntary health insurance buys insurance against co-payments and deductibles, and buys coverage for higher quality care. Using a reduced form approach, he found that health does not correlate with voluntary health insurance uptake. However, using a structural model approach he explained this apparent lack of correlation from two offsetting underlying structural relationships; low health increases the demand for voluntary health insurance (adverse selection), but at the same time low health individuals are more likely to be rejected by insurance companies, i.e. insurers prefer individuals with good health (risk-selection).

3.3 WHO BUYS SUPPLEMENTAL HOSPITAL INSURANCE? ANALYSIS BASED ON HEALTH INTERVIEW SURVEY 2001

Since there is no information on supplemental hospital insurance available in the IMA data, we looked for a next-best dataset to analyse the determinants of supplemental hospital insurance. We decided to use the Belgian Health Interview Survey 2001 (HIS 2001) since it includes information on supplemental hospital insurance take-up and it has exceptionally rich information on health (more information on the HIS 2001 is given in Appendix 5). Since health status is only adequately defined at the individual level, we analysed the data at this level. In this section, we describe the best analyses we could do using the HIS 2001. In sections 3.4 and 3.5, we use the HIS 2001 to impute who has supplemental hospital insurance in the IMA data.

The remainder of this section is organised as follows. First, we start by presenting the percentage of Belgians that buy supplemental hospital insurance. Next, we analyse what individual characteristics determine supplemental hospital insurance take-up.

3.3.1 The dependent variable: supplemental hospital insurance

The respondents of the HIS 2001 provided information on supplemental hospital insurance. They had to answer the following question: "*The personal contribution in case of hospitalisation can be heavily reduced in case of hospital insurance. Such insurance can be at your own cost or at the initiative of your employer. The insurance can be provided by a sickness fund or a private insurer. Do you have such a supplemental hospitalisation insurance at your own cost or provided by your employer?" (Answers: yes, no, don't know and no answer)*"[www]. From the phrasing, it follows that we cannot distinguish between employer-provided insurance and private insurance. In the total sample, 60.84 percent claim to have supplemental hospital insurance, while this percentage is slightly higher (62.36 percent) in the sample used to estimate the determinants of supplemental hospital insurance[xxx].

3.3.2 What determines supplemental hospital insurance take-up?

To get a better insight into the determinants of supplemental hospital insurance, we relate it to demographic, socio-economic, geographical, insurance and health variables. More information on the independent variables can be found in appendix 5. Since supplemental hospital insurance is recorded as a dummy variable, we calculate partial effects derived from a probit model. The results are shown in Table 29. The models in column (1) and (2) only differ with respect to the detail of geographical variation. The model in column (1) allows for differences between Brussels, Flanders and the Walloons, whereas model (2) allows for differences between the provinces. Since statistical tests show that the specification with provinces is preferable and since the differences between models (1) and (2) in terms of estimated partial effects is negligible, we stick to model (2) to discuss the determinants of supplemental hospital insurance. This is also in line with the specification choices made in the previous chapter.

To interpret the partial effects in Table 29, it is important to know the reference individual in the estimation. He is a male Belgian employee with secondary education and an equivalent income between 20,000 and 40,000 BEF[yyy]. He is aged between 40 and 44 and living in the province of Antwerpen. For continuous variables (GHQ-12 score, SF-36 score, complaints measuring mood and pain), the partial effects should then be interpreted as the change in the probability to have supplemental hospital insurance for an individual with average characteristics[zzz] resulting from a one-unit change in the continuous variable (e.g. the difference in probability between two individuals that differ one unit in the GHQ12-score and that have otherwise average characteristics, is -0.004). For dummy variables (all other independent variables), the partial effect gives the change in the probability for an individual with average characteristics resulting from the dummy taking the value one rather than zero (e.g. the difference in probability between an individual with and without preferential treatment, that has otherwise average characteristics, is -0.062).

[www] Translation of: "De persoonlijke bijdrage in geval van hospitalisatie kan sterk verminderd worden indien een bijkomende hospitalisatieverzekering afgesloten wordt. Dergelijke verzekering kan u zelf afsluiten of op initiatief van uw werkgever worden afgesloten en dit zowel bij een ziekenfonds als bij een privé-verzekeraar. Heeft u op eigen initiatief of op initiatief van uw werkgever een dergelijke bijkomende hospitalisatieverzekering afgesloten?"

[xxx] Both samples are different because in the estimation sample only the observations are retained for which information about the independent variables is available.

[yyy] One € equals 40.3399 Belgian Francs (BEF).

[zzz] In practice we calculated weighted means since all analyses in this chapter use normalized sampling weights.

Table 29: Determinants of supplemental hospital insurance in Belgium (HIS 2001)

	(1)	(2)		(1)	(2)
sex	-0.016	-0.018	sahverygood	-0.075**	-0.080**
age 15-19	-0.027	-0.048	sahfair	-0.078**	-0.068*
age 20-24	-0.080	-0.083	sahpoor	-0.142**	-0.126*
age 25-29	-0.077+	-0.087*	sahverypoor	-0.062	-0.058
age 30-34	-0.022	-0.023	bmi_018	0.039	0.034
age 35-39	-0.009	-0.011	bmi_2530	0.028	0.030
age 45-49	-0.011	-0.010	bmi_30more	-0.022	-0.023
age 50-54	0.114**	0.116**	chronic	0.014	0.011
age 55-59	0.093*	0.093*	GHQ12	-0.003	-0.004
age 60-64	0.195**	0.193**	SF36	-0.000	-0.000
age 65-69	0.117*	0.117*	acute	0.035	0.034
age 70-74	0.002	-0.001	chron	0.014	0.007
age 75-79	0.019	0.010	compl_f1	0.001	-0.001
age: 80-84	-0.046	-0.043	compl_f2	0.009	0.006
age: 85+	-0.169+	-0.180+	sport	0.049*	0.050*
single	-0.079*	-0.081*	smoke_dai	-0.039+	-0.042*
single_child	0.043	0.039	smoke_occ	-0.082*	-0.075+
couple	-0.017	-0.017	alcohol	0.044+	0.042+
complex	-0.037	-0.035	EUmember	-0.067	-0.063
no_primary	-0.097**	-0.104**	nonEU	-0.208**	-0.203**
higher	0.097**	0.102**	Brussels	-0.054*	
university	0.059+	0.064*	Walloons	-0.060**	
otherdipl	0.059	0.049	provvlbrabant		-0.080+
eqinc: 0-20	-0.204**	-0.190**	provwestvl		0.115**
eqinc: 40-60	0.055*	0.056*	provoostvl		0.033
eqinc: 60-80	0.060+	0.072*	provlimburg		0.091*
eqinc: 80-100	0.132*	0.147**	provbrussel		-0.026
eqinc: 100+	0.073	0.086	provbrabantw		-0.008
self-employed	-0.073*	-0.069*	provhainaut		-0.100**
retired	-0.087*	-0.080*	provliège		0.056
sick	-0.095	-0.096+	provluxemb		-0.025
unemployed	-0.224**	-0.217**	provnamur		-0.074
other notworking	-0.173**	-0.176**	Observations	6398	6398
preftreat	-0.054+	-0.062+	Pseudo R^2	0,097	0,108

Normalized sampling weights were used (see appendix 5). Statistical inference is based on robust covariance matrices that allow for clustering at the household level: +: significant at 10%; *: significant at 5%; **: significant at 1%; shaded area: jointly not significant at 5%.
For the labeling of the variables, see appendix 5.

We can summarize the main findings of Table 29 as follows. First, supplemental hospital insurance take up hardly differs between the sexes, but it seems to differ more by age. Until the age of 50, take-up is constant, but persons between 50 and 70 years are more likely to have supplemental hospital insurance. For example, the difference in the probability to have supplemental hospital insurance for persons between 60 and 64 years and the reference age-category (40-44) amounts to 0.193. After the age of 70, the

take up rate decreases to the level of persons aged 40-44, except for the 85+. This inverted U-shape seems to be demand-driven, whereas the finding of no difference in insurance coverage for the 40-44 and the 70+ might result from exclusion restrictions in insurance policies or from higher prices offered to elderly. Unfortunately, lack of data on restrictions and prices makes it impossible to test this hypothesis. With respect to family type (couples with children are the reference category), we find unsurprisingly that being single reduces the probability to have supplemental hospital insurance. The same holds for non-Belgians, although the effect is much stronger for individuals originating from outside the European Union.

Second, all socio-economic variables are relevant determinants. Individuals with a university and higher education degree are more likely, and individuals with no or primary education are less likely to have supplemental hospital insurance (compared to the reference category of secondary school). However, the results suggest that the relationship is non-monotonic, i.e. individuals with a university degree are less likely to have supplemental hospital insurance than individuals with higher education degree. For equivalent income, a similar pattern is found, i.e. in general insurance take up is associated with higher income, but the pattern is non-monotonic. We further find that employees are more likely than any other occupational category to have supplemental hospital insurance. Among the other categories, we observe in decreasing order the self-employed, retired, sick, other not working and the unemployed. The finding for the self-employed is reasonable since – compared to some employees – they have to finance their insurance policies privately[aaaa]. For disabled or invalid and retired individuals the effect is probably driven by exclusion restrictions or higher prices of policies, although we would need more data to check this explicitly[bbbb].

Third, whether an individual is eligible for preferential treatment has a negative (but rather insignificant) effect on insurance take-up.

Fourth, health and lifestyle variables are important for explaining supplemental hospital insurance. Compared to individuals in good self-assessed health, individuals in fair and poor health are less likely to take out insurance, whereas being in very poor health has no effect[cccc]. Again the relationship is not monotonic, in that individuals in very good health less often buy supplemental hospital insurance. The other health variables do not have strong effects. With respect to the lifestyle variables, we find that practising sport has a positive effect, whereas smoking has a negative effect.

Fifth, with respect to place of residence, we find (from column (1)) that inhabitants of Brussels and the Walloons have a lower probability to have supplemental hospital insurance. Nevertheless, these findings mask substantial variation within the regions. From column (2), we see that inhabitants of the Walloon provinces and Brussels have a similar probability to have supplemental hospital insurance as the inhabitants of the province of Antwerpen, with the exception of the province of Hainaut. Within Flanders, we observe more supplemental hospital insurances in the province of Limburg and West-Vlaanderen than in the province of Antwerpen and less in Vlaams-Brabant.

To conclude, there is some weak evidence of (health-related) adverse selection. Whether this is due to exclusion restrictions and risk-rated insurance premiums cannot be inferred from the HIS-data, however. At the same time, there is strong evidence for a socio-economic bias in insurance uptake. Except for the very high incomes and the best educated people, there is in general a positive relationship between socio-economic status and the take up of supplemental hospital insurance. This immediately implies that there is also a socio-economic bias in the protection against high OOP payments. This may be a partial explanation for the patterns in the choice of room that we have discovered in the previous chapter. Of course, without an integration of the

[aaaa] Note that this probably implies higher insurance premiums since there is less risk pooling due to absence of collective contracts.

[bbbb] The HIS 2001 does not inform on job characteristics. This is unfortunate since Berghman et al., 2005[15] have shown that employer-provided insurance policies are more often taken out/provided to employees with a long term contract, working in large firms and working in specific sectors.

[cccc] Individuals in very poor health are a small group, however, and it is possible that the effect is not very precisely estimated.

information from different data sources this must remain a (albeit highly probable) working hypothesis. In the following sections we will try to go somewhat further. However, given the limited information in the IMA-data, this will only be a first and rough approximation.

3.4 COMBINING THE DATA FROM HIS 2001 AND IMA

One way to export the information from HIS 2001 into the IMA-dataset is to implement an imputation procedure. We will therefore first estimate again the determinants of supplemental hospital insurance in Belgium using the HIS 2001, but we will now restrict the determinants to those variables that are available both in the IMA data and in HIS 2001. It obviously follows that these estimates are inferior compared to the estimates in the previous section. However, exploiting the correspondence between the explanatory variables, we can estimate for each individual in the IMA data the probability that she will have supplemental hospital insurance. We can then use these predicted probabilities to impute the availability of supplemental hospital insurance in the IMA data. This will give us at least a statistical indication of the effects of supplemental hospital insurance on OOP payments.

The results of the imputation procedure are described in section 3.5. The remainder of this section is organised as follows. Section 3.4.1 discusses those variables in the HIS 2001 that have counterparts in IMA data. We then present the estimates of the determinants of supplemental hospital insurance in section 3.4.2.

3.4.1 Dependent and independent variables

We use the same dependent variable as in section 3.3, i.e. whether individuals have supplemental hospital insurance. Compared to section 3.3, we have now more than 2,000 additional observations since we include a lower number of independent variables, and thus loose less observations due to item-non-response. More specific information on the independent variables can be found in appendix 5. Despite the 2,000 additional observations, the share of individuals with supplemental hospital insurance (61.09%) hardly deviates from that in section 3.3.

3.4.2 The determinants of supplemental hospital insurance

The results of the simplified model are shown in Table 30. In this case we have applied a binary logit model (as in Tables 8 and 20), because this was easier for doing the imputation exercise in the IMA-data. The results are very comparable to the ones that have been obtained with a probit model. Table 30 again shows partial effects, which can be interpreted in an analogous way as in Table 29.

Table 30: Determinants of supplemental hospital insurance – simplified logit specification

Variable	Partial effects from logit model
Sex	-0.036**
age 15-19	-0.196+
age 20-24	-0.092*
age 25-29	-0.055
age 30-34	0.015
age 35-39	-0.003
age 45-49	0.014
age 50-54	0.093**
age 55-59	0.110**
age 60-64	0.156**
age 65-69	0.091*
age 70-74	0.009
age 75-79	-0.004
age 80-84	-0.068
age 85+	-0.209**
preftreat	-0.113*
wdro	0.030
elderly	-0.316*
sel	-0.086**
ret_em	-0.126**
ret_selnw	-0.221**
sidi_em	-0.259**
sidi_selnw	-0.069
unem_em	-0.294**
unem_selnw	-0.371**
nw	-0.251**
provvlbrabant	-0.076+
provwestvl	0.092**
provoostvl	-0.005
provlimburg	0.074*
provbrussel	-0.086**
provbrabantw	-0.013
provhainaut	-0.153
provliège	0.025
provluxemb	-0.072*
provnamur	-0.090+
obs	8,667
pseudo R^2	0.0658

Normalized sampling weights were used. Statistical inference is based on robust covariance matrices that allow for clustering at the household level: +: significant at 10%; *: significant at 5%; **: significant at 1%. For the labeling of the variables, see appendix 5.

Although the number of variables is much more limited than in Table 29 (health information, e.g., is completely missing), the overall pattern of the results in Table 30 is similar. First, we find that males have a slightly lower probability to have a supplemental hospital insurance. Second, the influence of age follows again an inverted U-shape. Individuals younger than 25 and older than 85 have a lower probability to have supplemental health insurance for hospitalisation. The opposite holds for the age category 50-69. Third, individuals that qualify for preferential treatment are less likely to have supplemental health insurance and this probability is even lower for individuals whose qualification for lower co-payments is based on receiving a subsistence allowance (i.e. entitlement to guaranteed minimum income, guaranteed income for elderly or subsistence income). The socio-economic bias therefore can be found also in this specification. Fourth, we find major differences across social status. Employees are most likely to have supplemental health insurance, and we then have in decreasing order self-employed (sel), retirees (ret), individuals not working (nw), individuals that receive a sickness or disability allowance (sidi), and unemployed. For the retired, the unemployed and the disabled we also use information about their earlier occupation. Retired and unemployed who have been employees before have a larger probability of having a supplemental hospital insurance than retired and unemployed who were self-employed or not working. Disabled who have been employees before have a lower probability of having supplemental hospital insurance. Fifth, we find that persons living in West-Vlaanderen have the highest probability to have a supplemental health insurance. In decreasing order, we then get the provinces of Limburg, Liège, Antwerpen, Oost-Vlaanderen, Brabant-Wallon, Luxembourg, Vlaams-Brabant, Brussels, Namur and Hainaut.

It has to be stressed that none of our findings in this section should be interpreted as causal pathways. Due to the much poorer information, the Pseudo R^2 is considerably lower than that of the model in section 3.3.2. The results are not more and not less than partial correlations and the primary goal is to use the estimates for the imputation exercise. We therefore applied two additional procedures to get some grasp on the predictive power of our model, which is the most important feature for the quality of the imputation.

First, we checked the percentage of correct predictions. We found that our model predicts 22% better than a purely random prediction. Second, we did out-of-sample forecasts which check the predictive power of the model and which reveal whether a model suffers from over-fitting[dddd]. It was found that the model predicts – even out of sample – better than a purely random prediction. On the other hand, it has to be admitted (not surprisingly) that it is not predicting very accurately. More detailed results from both test procedures are available upon request.

3.5 SUPPLEMENTAL HOSPITAL INSURANCE AND OOP PAYMENTS: A FIRST APPROXIMATION

In this section, we return to the IMA data and to the distribution of out-of-pocket payments over the population. As was emphasized before, the availability of supplemental hospital insurance may have a crucial influence from the point of view of financial accessibility: once one has taken supplemental hospital insurance, the risk related to large out-of-pocket payments when hospitalised disappears/reduces considerably, and is replaced by the payment of an insurance premium. Moreover, it is essential to see the possible interdependency between these two effects. We know from chapter 2 that supplements (not co-payments) are sharply differentiated according to choice of room. At the same time, it can reasonably be assumed that the choice of room is strongly influenced by the availability of supplemental hospital insurance. If this correlation were perfect, we would see a social partitioning of the patients. Those with supplemental hospital insurance would end up in single (or two-person) rooms – and the out-of-pocket payments would be largely paid by the insurer. Those without supplemental hospital insurance would opt for (or be forced into) common rooms, and would then be to some extent protected against very large supplements. Of course,

[dddd] We operationalised the out-of-sample forecasts following a procedure similar to Jiménez et al., 2002[18].

given the differentiation in supplemental hospital insurance, this would imply a strong social stratification in hospitals – and raise questions about the possibility of treatment differences. Moreover, there are supplements and co-payments to be paid even in common rooms.

Given this background we will try to give a first approximation of the effects of supplemental hospital insurance in this section. We will first impute the availability of supplemental hospital insurance in the IMA-data and then recalculate the out-of-pocket payments for the different individuals. For the imputation we compare the results of two methods.

Our first method uses the estimates from section 3.4.2 to simulate the availability of supplemental hospital insurance for all individuals in the IMA data. Recall that we only used information on gender, age, preferential treatment, social status and province to predict supplemental hospital insurance. It follows that – compared to the preferred estimates in section 3.3 – the socio-economic bias in supplemental hospital insurance uptake is less marked in these estimates. Combining the coefficient estimates from the logit model in Table 30 with the information on gender, age, preferential treatment, social status and province, we calculate for each adult in the IMA data a predicted probability to have supplemental hospital insurance. We draw a random number from the logistic distribution and use this number to assign supplemental hospital insurance: an adult has (no) supplemental hospital insurance if this random value is smaller (larger) than the predicted probability from the previous step. Since the majority of Belgian supplemental hospital insurance policies provide household coverage, we assume that children are covered if their parents are.

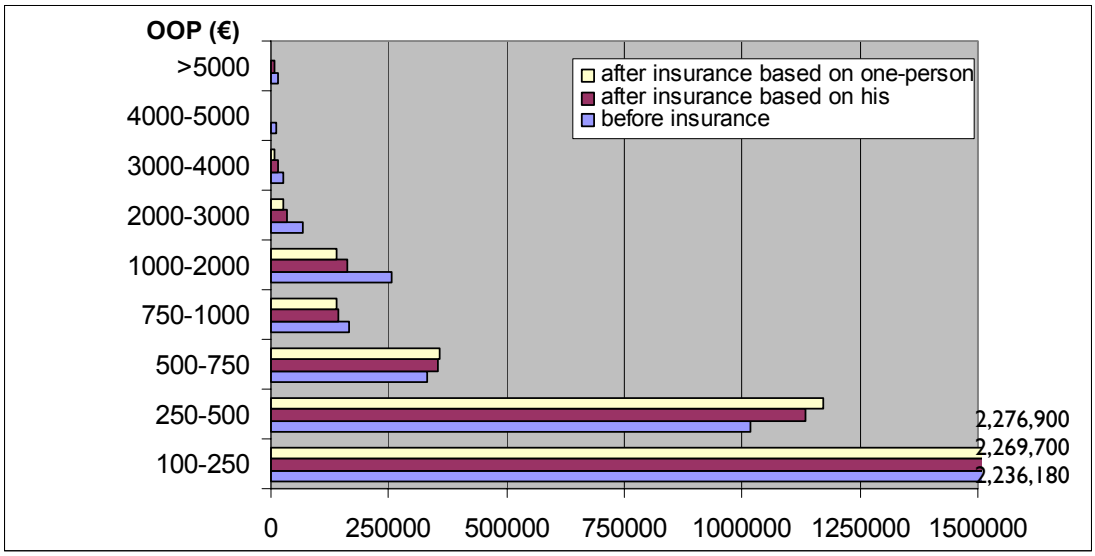
The second method can be seen as a test of the robustness of the (imperfect) imputation procedure described before. We now assume that all individuals in a one person room have supplemental hospital insurance. For the remaining individuals we assign supplemental hospital insurance in a random way, but such that overall 61.09 percent of the individuals have supplemental hospital insurance.

In the next step, we adjust out-of-pocket payments downwards for those that have been simulated to be covered by supplemental hospital insurance. The downward adjustment is similar for both simulations of supplemental hospital insurance and is based on what seems to be more or less a standard insurance contract in Belgium. We assume that hospital (not daycentres) out-of-pocket payments are covered by the insurance contract with the exception of (a) diverse costs, non-reimbursed implants and paramedical material; (b) out-of-pocket payments in psychiatric and chronic hospitals. Moreover, we also assume that there is a deductible of €150. We do not adjust outpatient out-of-pocket payments, which means that we neglect the fact that sometimes part of these outpatient out-of-pocket payments (before and after the hospital stay) are taken in charge by the insurer. It is obvious that the resulting out-of-pocket payments have to be interpreted with extreme caution. Yet they may nevertheless give a rough picture of the effects of supplemental hospital insurance at the aggregate and at the meso-level, i.e. at the level of broader age categories and social groups. Note that contrary to the analyses in chapter 2, we do not consider the distribution of supplements after supplemental hospital insurance in isolation since supplemental hospital insurance also covers co-payments. Remember also that the self-employed are excluded from the analysis.

Results at the aggregate level are shown in Figure 4. The blue bars in Figure 4 refer to out-of-pocket payments (both in- and outpatient) before the imputation of supplemental hospital insurance, the red bars refer to out-of-pocket payments after the imputation based on HIS, and the yellow bars refer to out-of-pocket payments after imputation based on the 'one-person room assumption'. Note that results are only shown for out-of-pocket payments as of the range €100-€250, since there are no changes in the lower ranges because of the deductible of €150. In addition, the scale of the frequencies is truncated at 1,500,000; the frequencies for the OOP-category €100-€250 are next to the bars. It can be seen that under both approximations frequencies of out-of-pocket payments of the highest categories become much smaller and that this effect is

somewhat stronger for the one-person room assumption[eeee]. Using the HIS assumption, the number of extreme payers (>€1,000) is reduced from about 373,000 individuals to about 225,160 individuals[ffff]. Reversely, we observe that the number of individuals with out-of-pocket payments between €100 and €1,000 increases.

Figure 4: Distribution of out-of-pocket payments >€100 in the population before and after imputation of supplemental hospital insurance: frequencies



We thus find that imputation of supplemental hospital insurance leads to a more optimistic picture about the distribution of out-of-pocket payments. At the same time, however, the number of extreme payers remains non-negligible. While we should not overestimate what can be done with our imputation, it still seems interesting to analyse the distribution of out-of-pocket payments before and after supplemental hospital insurance across subgroups of the population. We therefore use the same method as in chapter 2, although we focus here on total out-of-pocket payments. The results are shown in Table 31. The list of explanatory variables is the same as in Table 7. Recall that this is merely a somewhat sophisticated way of computing mean out-of-pocket payments for different groups.

[eeee] This is plausible since out-of-pocket payments are typically higher for individuals residing in a single room (see chapter 2).

[ffff] For the one-person room assumption, this number further decreases to 180,020.

Table 31: Distribution of out-of-pocket payments (OOP) with and without imputation of supplemental hospital insurance: regression analysis

	inclusive 0 (N=271,813)			exclusive 0 (N=255,787)		
	OOP	OOP - HIS	OOP - ONE	OOP	OOP - HIS	OOP - ONE
	(1)	(2)	(3)	(4)	(5)	(6)
Mean	*217.92*	*187.09*	*176.60*	232.97	*200.01*	*188.79*
Adj R²	*0.12*	*0.14*	*0.16*	*0.12*	*0.14*	*0.16*
Intercept	**73.75**	**71.19**	**71.51**	**82.94**	**80.04**	**80.38**
preftreat	**-159.13**	**-127.56**	**-117.83**	**-169.44**	**-135.79**	**-125.39**
prov_02	-7.41	-5.01	-4.81	-6.24	-3.87	-3.71
prov_03	-5.26	-3.11	-1.62	-5.50	-3.28	-1.73
prov_04	2.88	2.83	1.19	3.43	3.31	1.54
prov_05	**-20.28**	**-12.40**	**-11.17**	**-21.89**	**-13.58**	**-12.30**
prov_06	2.62	-7.35	**-9.93**	12.66	0.24	-3.01
prov_07	**39.41**	**22.38**	**14.36**	**42.42**	**24.25**	**15.70**
prov_08	0.02	4.75	5.07	1.65	6.58	6.89
prov_09	**23.53**	**19.72**	**14.15**	**24.98**	**20.93**	**15.01**
prov_10	2.03	0.37	5.69	3.56	1.57	7.14
prov_11	6.92	14.17	**14.27**	8.02	**15.65**	**15.73**
M_0	53.15	**41.45**	**34.28**	**67.37**	**53.47**	**44.87**
M_1-4	**44.05**	**39.31**	**37.61**	**37.34**	**32.91**	**31.23**
M_5-9	6.10	6.39	5.54	1.11	1.82	0.98
M_10-14	9.31	8.80	8.18	4.44	4.33	3.75
M_15-19	9.36	5.23	4.42	6.53	2.34	1.54
M_20-24	-9.78	-10.31	-11.25	-10.20	-10.74	-11.76
M_25-29	-6.06	-7.35	-7.48	-6.00	-7.43	-7.52
M_35-39	7.72	6.40	6.52	7.57	6.28	6.47
M_40-44	21.02	16.24	16.03	22.65	17.45	17.25
M_45-49	**41.71**	**34.71**	**30.52**	**44.67**	**37.07**	**32.46**
M_50-54	**88.51**	**71.95**	**64.86**	**93.48**	**75.67**	**67.99**
M_55-59	**135.90**	**101.73**	**93.31**	**142.78**	**106.17**	**97.13**
M_60-64	**159.74**	**127.87**	**113.57**	**165.90**	**131.94**	**116.58**
M_65-69	**236.57**	**186.22**	**160.63**	**239.87**	**187.38**	**160.36**
M_70-74	**295.46**	**237.00**	**208.11**	**297.02**	**236.83**	**206.66**
M_75-79	**335.76**	**271.02**	**244.19**	**336.40**	**270.07**	**242.16**
M_80-84	**341.55**	**271.64**	**251.47**	**343.49**	**271.63**	**250.51**
M_85-89	**384.58**	**309.15**	**256.60**	**394.26**	**315.69**	**260.58**
M_90-94	**272.06**	**234.93**	**219.35**	**275.73**	**237.03**	**220.41**
M_95+	**361.42**	**330.97**	**250.22**	**369.99**	**337.83**	**253.08**
F_0	35.20	24.44	20.97	47.52	34.75	30.57
F_1-4	26.67	22.44	**20.35**	19.94	16.03	13.94
F_5-9	-6.10	-6.24	-6.81	-12.06	-11.76	-12.27
F_10-14	8.60	8.34	7.43	4.00	4.11	3.21
F_15-19	**38.05**	**33.73**	**31.69**	**32.78**	**28.70**	**26.63**
F_20-24	**60.34**	**48.60**	**44.06**	**54.94**	**43.11**	**38.46**
F_25-29	**150.56**	**106.58**	**84.10**	**147.69**	**102.46**	**79.19**
F_30-34	**157.86**	**114.69**	**91.85**	**154.98**	**110.66**	**87.08**
F_35-39	**106.56**	**84.23**	**74.49**	**102.43**	**79.64**	**69.60**
F_40-44	**94.80**	**82.31**	**76.25**	**90.75**	**78.12**	**71.86**
F_45-49	**104.44**	**86.93**	**81.44**	**101.09**	**83.26**	**77.59**
F_50-54	**145.14**	**125.46**	**118.61**	**142.71**	**122.67**	**115.60**
F_55-59	**163.97**	**139.73**	**126.26**	**162.60**	**137.69**	**123.69**
F_60-64	**203.94**	**166.53**	**149.36**	**202.65**	**164.21**	**146.23**
F_65-69	**242.54**	**201.35**	**184.19**	**239.30**	**197.37**	**179.48**
F_70-74	**311.73**	**250.86**	**224.46**	**308.39**	**246.55**	**219.26**

F_75-79	**366.95**	**293.78**	**268.52**	**363.56**	**289.41**	**263.34**
F_80-84	**389.68**	**316.10**	**291.27**	**386.07**	**311.68**	**286.07**
F_85-89	**371.46**	**299.80**	**270.57**	**367.51**	**295.04**	**264.96**
F_90-94	**258.84**	**230.37**	**205.28**	**252.73**	**224.46**	**198.62**
F_95+	**236.39**	**189.97**	**188.53**	**227.93**	**181.98**	**180.27**
died_q1	-33.51	**-124.30**	**-134.16**	-21.60	**-120.89**	**-132.16**
died_q2	**258.55**	**108.06**	**60.85**	**255.00**	**103.52**	**56.03**
died_q3	**470.99**	**266.77**	**220.85**	**470.94**	**264.85**	**218.65**
died_q4	**766.42**	**475.37**	**384.99**	**772.57**	**477.60**	**386.11**
res_not lowY	33.83	21.29	19.24	48.23	33.11	30.58
res_lowY	**36.72**	**29.52**	**30.91**	**51.75**	**42.49**	**43.97**
inval_tit	**312.51**	**268.07**	**256.97**	**313.78**	**268.97**	**257.84**
inval_dep	**59.42**	**48.48**	**45.81**	**65.87**	**53.99**	**51.07**
handic_tit	**110.98**	**102.23**	**93.33**	**124.46**	**115.12**	**106.03**
handic_dep	85.90	**68.25**	**56.34**	92.07	**73.48**	**60.94**
retired	**68.35**	**55.60**	**57.45**	**73.11**	**59.80**	**61.96**
widow	**86.23**	**66.93**	**68.84**	**94.58**	**73.94**	**75.96**
orphan	**222.53**	**234.01**	**245.74**	**245.76**	**258.12**	**271.32**
self_empl	-19.37	-24.20	**-27.84**	-22.33	**-27.33**	**-30.97**
unemployed	-8.43	-5.97	-1.76	-5.96	-3.47	1.02
parttime	-36.39	-27.24	-19.22	-39.03	-29.28	-20.66
early_retired	32.20	13.99	19.18	31.95	12.63	18.32
nursing_pay_B	**526.20**	**363.99**	**297.14**	**523.15**	**361.15**	**294.29**
nursing_pay_C	**472.09**	**378.55**	**321.96**	**468.07**	**375.42**	**318.97**
phys_E	**430.82**	**356.73**	**338.15**	**424.84**	**351.45**	**333.10**
incr_child_ben	**147.63**	**128.20**	**125.24**	**150.90**	**130.42**	**126.85**
integr_handic	**208.16**	**181.28**	**171.33**	**216.13**	**188.01**	**177.54**
help_elderly	**68.86**	**67.89**	**52.77**	**70.06**	**68.65**	**53.24**
help_thirdparty	-38.45	-24.48	-33.97	-41.38	-26.78	-36.49
ben_invalidity	-92.78	**-99.55**	-68.66	-93.21	**-100.17**	-68.25
lumpsum_thirdparty	-153.15	-132.69	-116.60	-161.02	-139.47	**-122.41**
guarant_Y_-60	**40.47**	**35.00**	**28.77**	**42.76**	**37.89**	**30.80**
guarant_Y_+60	**-41.51**	-26.18	-19.37	-39.37	-24.24	-17.47
subsidy_handic	33.48	**40.23**	**48.03**	**35.22**	**41.94**	**49.83**
ben_unempl	-14.49	-3.10	-4.32	-10.26	1.73	0.19
work_incap	**359.60**	**266.57**	**234.25**	**353.01**	**260.17**	**227.92**

For the labeling of the variables, see appendix 5.

The first three columns give results for the entire sample, while the last three are restricted to positive out-of-pocket payments only. Although there is only action in the last three columns (supplemental hospital insurance has no effect on zero out-of-pocket payments), we present the three left columns in order to have averages for the total population which are interesting for descriptive purposes. Column (1) and (4) are the regression results for out-of-pocket payments before supplemental hospital insurance. Column (2) and (5) are the regression results after correcting out-of-pocket payments for supplemental hospital insurance imputed from HIS, and columns (3) and (6) are the results after imputing insurance using the 'one-person room' assumption. The figures in bold indicate that the coefficients are significantly different from zero. These are relevant to check within a column what personal characteristics are correlated with out-of-pocket payments. However, in this section, we are primarily interested in the effect of supplemental hospital insurance, i.e. the extent to which the coefficients in columns (2)-(3) and (5)-(6) change due to supplemental hospital insurance. The differences that are statistically significant are highlighted in yellow[gggg].

gggg We have used T-tests on equality of coefficients that allow for different variances, but that assume independent samples. Although we have used a significance level of 0.0001, we nevertheless might reject equality of coefficients too often since the assumption of independent samples is likely to be violated in our setting. A

There are some interesting findings in Table 31. First, looking at the pattern of the bold coefficients, it is seen that the set of characteristics that correlates with out-of-pocket payments does not alter after correcting for supplemental hospital insurance[hhhhiiii]. Second, both simulation procedures for supplemental hospital insurance (imputation from HIS 2001 and 'one-person room' assumption) lead to qualitatively similar results. Note however that one can only deduce from this that both procedures are equally good or bad. Third, mean out-of-pocket payments are reduced by €30 (€40 using the 'one-person room' assumption). Nevertheless, the intercept does not differ statistically, which means that correcting for supplemental hospital insurance does not affect the out-of-pocket payments of the reference person (a male member of the active population (PUG/TIP), between 30 and 35 years old, living in the province of Antwerpen and not characterized by any of the other indicators of morbidity and social vulnerability). This was to be expected given the relatively low out-of-pocket payments of the reference person before correction for supplemental hospital insurance. It thus follows that the reduction in mean out-of-pocket payments will be attributable to specific subgroups. Our findings are:

- The age patterns of the effects of supplemental hospital insurance reveal unsurprisingly that elderly see their amount of out-of-pocket payments reduced. Also interesting is the finding that women at reproductive age (25 to 35 year) experience a reduction in out-of-pocket payments.
- Supplemental hospital insurance reduces out-of-pocket payments for individuals in the last months of their life.
- Invalids, chronically ill (nursing_pay_B, phys_E) and individuals that had at least one day of work incapacity also experience a large reduction.
- The coefficient on preferential treatment becomes less negative after correction for supplemental hospital insurance. This means that the difference in out-of-pocket payments between individuals with and without preferential treatment diminishes if we take into account supplemental hospital insurance. This was to be expected given the negative correlation found between preferential treatment and having supplemental hospital insurance.
- Note also that we find little evidence of a stronger effect of supplemental hospital insurance for higher socio-economic groups which one might expect given the socioeconomic bias in supplemental hospital insurance take up (see section 3.3). However, this is most probably due to the fact that our imputation procedures are unsatisfactory in this respect.
- The availability of supplemental hospital insurance has no significant influence on the pattern of regional effects.

3.6 CONCLUSION

In this chapter we have tried to correct for the effects of supplemental hospital insurance on out-of-pocket payments (i.e. the sum of co-payments and supplements). Since there is no information about supplemental hospital insurance in the IMA-data, we have used the data from HIS 2001, which do include information on supplemental hospital insurance take-up.

Using the HIS 2001, we found that approximately 61 percent of Belgian adults buy supplemental hospital insurance. With respect to the determinants of supplemental

more satisfactory way of dealing with the independence assumption would be to base the analysis on SUR-regressions instead of separate OLS-regressions.

[hhhh] Note that the bold coefficients coincide to a large extent with the bold coefficients on co-payments in Table 7.

[iiii] If our imputation of hospital insurance hardly outperforms a random imputation rule, one would expect this result. Unfortunately, one cannot check this hypothesis.

hospital insurance, we can draw the following conclusions. First, we found a socioeconomic bias in supplemental hospital insurance take-up. More educated and richer individuals are more likely to buy supplemental hospital insurance. We also found that employees (compared to self-employed and the non working population) are most likely to have supplemental hospital insurance which might be due to employer-provided insurance and to more risk-rated insurance premiums for individuals that buy supplemental hospital insurance privately. Second, despite the extremely rich information on health status available in the HIS 2001, only weak evidence of health-related adverse selection was found. Unfortunately, we could not infer the importance of exclusion restrictions and risk-rated insurance premiums. Third, it was found that there are differences between the regions – i.e. inhabitants of Brussels and the Walloons have a lower probability to have supplemental hospital insurance than inhabitants of Flanders – but it was also found that the differences between provinces are larger. The majority of provinces have a similar share of inhabitants with supplemental hospital insurance, but this share is lower in Hainaut and Vlaams-Brabant, and higher in Limburg and West-Vlaanderen. Fourth, we found that persons between 50 and 70 years are most likely to have supplemental hospital insurance. A possible explanation could be that exclusion restrictions in insurance policies or higher prices might distract elderly from buying supplemental hospital insurance.

Next, we re-estimated the determinants of supplemental hospital insurance in Belgium using the HIS 2001, restricting the determinants to those variables that are available both in IMA-data and HIS 2001. These estimation results are used to impute who has taken out supplemental hospital insurance in the IMA data. We also used a second procedure to impute supplemental hospital insurance in the IMA-data by assuming that all individuals in a one-person room have supplemental hospital insurance. After imputing supplemental hospital insurance, we adjusted out-of-pocket payments for both imputations by implementing what looks like a standard insurance contract. A comparison between the resulting distributions of out-of-pocket payments after and before supplemental hospital insurance reveals a more optimistic picture about the out-of-pocket payments. We found that mean out-of-pocket payments are reduced by €30. This reduction is concentrated among elderly, women at reproductive age, and individuals with indicators of chronic illnesses. At the same time, however, the number of extreme payers remains non-negligible.

There can be no doubt that our imputation procedure is subject to much criticism. At the same time, our results suggest that it is quite important to incorporate supplemental hospital insurance in the analysis in a coherent way. Also from a policy perspective, more research with adequate data on the structure and the effects of supplemental hospital insurance is urgently needed.

Key points

- **Data from the Health Interview Survey indicate a strong socio-economic bias in the take-up of supplemental hospital insurance. A better education and a higher income generally increase the probability of having supplemental hospital insurance.**
- **Imputation of supplemental hospital insurance in the IMA-data reduces the number of persons who have to pay large supplements. It remains non-negligible, however. The link between supplemental hospital insurance and supplements is an important topic for further research.**

4 GENERAL CONCLUSIONS AND DISCUSSION

There is an increasing concern about the recent growth in supplements in the Belgian health care sector. Fear is growing that these supplements may become a heavy burden on the budget of the ill and may therefore threaten the financial accessibility of the Belgian health care sector and lead to postponement of necessary health care. To evaluate this threat it is necessary first to get a better insight into the facts: Who is paying supplements? For which items are supplements paid? How are supplements linked to provider and hospital behaviour? In this report we analysed the information in a random sample of 300,000 individuals for the year 2003. These data, obtained from IMA, give very rich and detailed information on reimbursements and co-payments in the compulsory health insurance system and an imperfect but satisfactory picture of hospital supplements. Supplements paid in the ambulatory sector are incompletely registered. Moreover, there is only incomplete information about the socio-economic background of the individuals and no direct information on their health situation. We therefore had to limit ourselves to an in-depth description of the distribution of the supplements over the population. This is in any case a necessary first step towards a broader analysis of financial accessibility.

Each analysis of the facts is confronted from the beginning with the difficult conceptual problem of how to define "supplements". This is not merely a definitional problem, because the answer has immediate consequences for the interpretation of the results. In the first place, it is obvious that what matters from the perspective of the patient is the total personal bill to be paid for health care, i.e. his or her total out-of-pocket (OOP) payments. In the second place, patients may to some extent be protected from large OOP payments.

To begin with the first point, the *first* and most important component of the OOP payments for patients relates to items included in the compulsory insurance cover. However, supplements are only a part of these OOP payments, which also include co-payments. While the distinction between co-payments and supplements is clear in principle (co-payments are the difference between the convention tariff and the reimbursed amount, supplements are what comes on top of the convention tariff), it is not always straightforward in actual applications. It is even more difficult to define unambiguously the *second* component of the supplements: OOP payments for items that (a) belong to the sphere of health care, but (b) are not taken up in the compulsory cover. Usually, these are fully taken up in the definition of supplements. One may argue that in this case the term "supplements" is in some sense a misnomer, since there is no corresponding item in the compulsory system "to be supplemented". In any case, decisions about whether or not to include health care items in the compulsory cover will have a crucial influence on the definition of "supplements". Moreover, in this setting we are necessarily confronted with some ambiguity, because we have to draw somewhere a boundary line between "health care" and other items. Healthy food is important for health, but food expenditures are not seen as supplements; over-the-counter medicines are usually seen as supplements (at least in principle), but one might ask whether all products sold in pharmacies are relevant health care items. In this report, we tried to remain as closely as possible to the legal definition of supplements for the first component. Since our data are extremely incomplete for the second component, our working definition basically reduced "supplements" to those items included in the IMA-data. These data mainly refer to inpatient supplements (including non-reimbursable drugs and material). We therefore definitely underestimate the total amount of supplements paid.

In the second place, patients are to some extent protected from OOP payments. Within the compulsory system, the maximum billing (MaB)-regulation puts a ceiling on the total amount of co-payments. The rules are different for different groups of individuals and not all co-payments are included. In fact, from the perspective of the patients, the distinction "included in the MaB" versus "not included in the MaB" is probably more important than the distinction "co-payments" versus "supplements".

While we of course focused on the effect of supplements on top of co-payments, we tried to take into account as well as possible the effects of maximum billing. There is a second, private, protection mechanism: the availability of supplemental hospital insurance. Patients who have supplemental hospital insurance have to bear only a small fraction of the OOP payments to be paid compared to those who do not have supplemental hospital insurance. A simple description of OOP payments billed by hospitals and providers therefore gives a biased picture of what individuals really have to pay. Our data set does not contain any information about the availability of supplemental hospital insurance. We therefore tried to approximate its effect using information from other sources. In the main part of the report, however, we simply looked at supplements and OOP payments without correction for the availability of supplemental hospital insurance.

Although the average amount of supplements paid was small in 2003 (about €60), about 296,000 individuals paid more than €500 and 137,000 individuals even more than €1,000. The larger amounts are mainly related to a stay in the hospital, especially in a single room, but it turns out that for some groups supplements in the ambulatory sector are not negligible either. Moreover, the two are correlated: not surprisingly, a stay in the hospital also leads to larger outpatient supplements. Given the extreme incompleteness of our data about ambulatory supplements, the fact that they are not negligible is quite striking. It turns out that large supplements often come on top of large co-payments. Even after taking into account the effects of the maximum billing (MaB)-regulation, we estimate that about 450,000 individuals had total out-of-pocket payments of more than €500.

For a correct evaluation of the social relevancy of these numbers, ideally two pieces of additional information would be needed. First, how do these costs relate to the overall economic situation, and more specifically, the income of these individuals? And secondly, are these costs recurrent or not? While our data are not sufficient to answer the first question, they allow us to draw a more detailed picture of who pays supplements. We also can derive some indications about the persistency of supplements over time.

Our more detailed analysis shows that the supplements are (not surprisingly) strongly linked to morbidity: higher age, disability and chronic illness significantly increase the odds of becoming extreme payers. On the other hand, people with preferential treatment seem to be relatively well protected, in the sense that they pay – keeping all other variables constant – a lower amount of supplements.

At first sight one might think that this simply reflects the structure of the regulation, which protects those on preferential treatment to some extent from paying large supplements. A closer analysis of the data on hospital stays, however, shows a more subtle picture. The average OOP payments for one inpatient stay in a Belgian hospital in 2003 amounted to €421, of which €262 are supplements. However, supplements per stay in the hospital are very similar for patients with and without preferential treatment, because the effects of the regulation are compensated by the longer length of stay of the former. Differences in overall supplements are then caused by the different room choices made by the different groups. Patients with preferential treatment opt much less for a single room and more for a common or two-person room. In fact, the same is true for other weaker socio-economic groups. Our results therefore suggest a strong social stratification in the choice of room.

Moreover, although the total amount of supplements per stay in a certain room type is about the same for patients with or without preferential treatment, the composition is not. Fee supplements for surgeons and gynaecologists are most important for patients without preferential treatment staying in single rooms (42% of total supplements); room supplements are most important for patients with preferential treatment staying in single rooms (39% of total supplements and even 45% if diverse costs are included). Room supplements are also most important for patients staying in two-person rooms, while supplements for drugs are most important for patients staying in common rooms. Supplements on material and implants are not negligible either. Moreover, for these supplements there is no special protection for the weaker groups.

We omitted from our general analysis the self-employed who have no right to reimbursement for small risks. The information on their OOP payments is very incomplete, precisely because it does not contain any details on their health care expenditures for small risks. A separate analysis for the self-employed shows that they consume on average less medical care. This is most probably due to behavioural differences. At the same time, however, they pay larger supplements. Not only do they opt much more than the general sample for a single room, they pay in addition larger supplements per day.

The finding that the chronically ill pay larger supplements is perhaps not surprising, but nevertheless worrying. In fact, this extends to psychiatric patients who – despite the lower supplements per day – end up with large supplements, because the average length of stay in a psychiatric hospital is ten times longer than the average length of stay in a hospital for acute care. The importance of length of stay in the determination of supplements is striking. It is a first indication of a certain kind of "persistency" in OOP payments. The regulation on the supplements does not take this element into account, since there is no analogy of the "maximum billing" for supplements.

We obtained more direct results about the non-recurrent nature of OOP payments by linking the data for 2003 with the data for 2002. Our analysis shows that a non-negligible fraction of the high payers in 2003 was already among the high payers in 2002. In fact, of the about one million individuals that have been hospitalized in 2003, almost one third had also been hospitalized in 2002. Again, in the present regulation concerning supplements, there are no special measures for these repeated payments extending over different years.

A closer look at the detailed price setting behaviour of the hospitals shows that supplements for some items are not negligible. To give but one example: supplements for medical fees in surgery and gynaecology are on average about 100% of the official tariff. Given that providers have a large degree of freedom in setting supplements, one would expect differences between different hospitals and different providers. This variation is indeed found. In addition, however, we find a significant regional clustering of these differences. The most striking finding are the large supplements to be paid in the hospitals in Brussels. Medical fees for surgery and gynaecology in a single room there amount on average to 150% of the official tariff. These differences are not explained by morbidity differences, but seem to be linked to differences in price setting behaviour of the hospitals. Of course, this brings us to the link between raising supplements and the financing system of Belgian hospitals. Analysis of this link was not part of this project, but it should be analysed more carefully in the future. However, it does not seem to be a sufficient explanation for the interregional differences that are found in the data. Moreover, it would be wrong to focus only on the level of supplements. There is also considerable variation in the structure of supplements over the different hospitals and there does not seem to be a clear pattern in this variation. Nor is it easy to distinguish differences in actual price-setting behaviour from differences in reporting and billing practices of hospitals. All in all, the structure of supplements is not at all transparent. Lack of transparency is an obvious problem for patients who may be surprised by the bill they get. It is also a problem for the formulation of an adequate regulatory policy.

As stated before, if one wants to draw conclusions about the link between supplements and financial accessibility, a crucial question relates to the availability of supplemental hospital insurance. Patients who are covered by a supplemental hospital insurance contract are largely protected against supplements during hospital stays. Moreover, there will most probably be a feedback effect, in that the choice of room will be codetermined by the availability of supplemental hospital insurance coverage. The IMA-data do not give any information on this important point. We therefore used the data from the Health Interview Survey 2001 to investigate the determinants of supplemental hospital insurance. Our analysis suggests strong indications of a socio-economic bias. In general the coverage varies positively with income and education.

We used the data from the Health Interview Survey to impute the availability of supplemental hospital insurance in the IMA-data. This imputation is far from perfect and

we compared it to a simpler procedure in which we assume that everybody who stays in a single room has supplemental hospital insurance coverage. We then recalculated the total out-of-pocket payments for the different individuals in the sample. Not surprisingly, this leads to a decrease in the number of extreme payers. Because of the data limitations, our results in this respect are only preliminary and should be interpreted with caution. The interaction between supplemental hospital insurance and supplements remains an important topic for further research.

The same is true for the behavioural and health consequences of supplements. A deeper analysis of the social and health consequences of out-of-pocket payments in Belgium requires the construction of a richer dataset, in which the expenditure data from IMA are matched with health and socio-economic (income) information from other sources.

Our results raise broader issues about the financing of the Belgian health care system, which go beyond the narrow limits of the report. There seems to be widespread consensus in Belgian society and among Belgian decision-makers that the financial accessibility of health care is an important objective. This implies that patients should only pay out-of-their own pocket if (a) there is a real danger of overconsumption; or (b) the costs relate to items which can be seen as luxury items or reflect the personal choices of patients. To analyse (a), a deeper analysis of the behavioural effects of own payments is necessary. Our data did not allow such a deeper analysis. We obtained some interesting insights concerning (b), however.

It can be argued that it is acceptable that the cost of luxury items is borne by the patients themselves. In this approach the lack of coverage of these items by the compulsory system (and the potential coverage by supplemental hospital insurance) is not a problem from a social point of view. It turns out, however, that most of the supplements in our analysis do not relate to luxury items. Remember the ambiguous content of the category "diverse costs". For those items (such as material or non-reimbursable medicines in hospital) that are definitely necessary health care items, large supplements are problematic from an ethical point of view (unless they could be justified as a means to fight overconsumption induced by the patients, which seems also doubtful in these cases). A more refined protection of patients with respect to these supplements should therefore be considered. Our analysis suggests that in this respect more attention should be given to the OOP payments related to very long stays in the hospital (including those of psychiatric patients) and to the persistence of supplements over time.

The situation is less clear for the bulk of supplements that are related to the choice of room. The social stratification in room choice came out very strongly from our analysis. This is definitely problematic if choice of room implies a different quality of health care. We have no evidence on this point, however. One can also raise the more subtle question whether in Belgium in 2006 the choice of a single room as such is a luxury item – or whether differences in service level and in personal comfort during hospital stays should be avoided. If the latter position is taken, the strong social stratification in the choice of room should become a policy concern. If, however, the comfort related to a single as compared to a more-person room, is seen as a luxury, the present differentiation of supplements and of room choice is not a severe problem.

All this immediately relates to the availability of supplemental hospital insurance. The growth of supplements in recent years has gone hand in hand with an increase in the importance of supplemental hospital insurance. In fact, as described before, the choice whether or not to include a specific health care item in the compulsory cover has immediate consequences for the definition of supplements itself. The relationship between a first (compulsory and public) pillar and a second (voluntary and private) pillar in health insurance is a topic which goes far beyond the limits of this report. What we can say, however, is that the actual distribution of supplemental hospital insurance shows a clear socio-economic bias. If the future policy option were to increase the amount of private and out-of-pocket financing of health care (including a continuous increase in supplements to be paid for necessary health care items), these socio-economic biases should become a matter of policy concern.

5 REFERENCES

1. Schokkaert E, Van de Voorde C. Health care reform in Belgium. Health Econ. 2005;14(Suppl 1):S25-39.
2. European Observatory on Health Care Systems. Belgium. Brussels: European Observatory on Health Care Systems; 2000.
3. RIZIV [Homepage on the Internet]. Brussel: RIZIV;c 2005 [updated 2005; cited 2006-09-28]. Invoering nieuwe remgeldplafonds op 1 november 2005. Available from: http://inami.fgov.be/drug/nl/general-information/refunding/ceiling/index.asp
4. Dienst voor administratieve controle. Bewijsmodaliteiten voor de inschrijving in het Rijksregister, bedoeld bij artikel 32, eerste lid, 15° van de gecoördineerde wet van 14 juli 1994. Nota. RIZIV; 2004. Available from: http://www.medimmigrant.be/riziv%20bewijsmodaliteiten%20ob.nl.pdf
5. Verniest R. Forfaitaire tegemoetkomingen voor chronisch zieken in het kader van de verplichte ziekteverzekering. CM-Informatie. 2006;223(juni Info-Fiche):1-8.
6. De Ridder R Maatregelen voor chronisch zieken: 1992 tot nu [Homepage on the Internet]. NVSM;c 2006 [updated 16 April 2006; cited 2006-09-28]. Maatregelen voor ernstige en chronisch zieken: Adequate en universele maatzorg. Available from: http://www.socmut.be/SocMut/Publicaties/Flits/Flits+mei+2006/Symposium-26-april-2006-Maatregelen-voor-chronisch-zieken-1992-tot-nu.htm
7. CM [Homepage on the Internet]. Brussel: CM;c 2005 [cited 2006-09-28]. Ziekenhuistarieven onder de loep. Available from: http://www.cm.be/nl/100/nieuws_home/ziekenhuistarieven.jsp?ComponentId=13332&SourcePageId=3682
8. Di Zinno T, Huchon J, Laasman J-M. Coûts hospitaliers : nature, ampleur et évolution des frais à charge du patient hospitalisé en hôpital général. Report. Bruxelles: UNMS; 2005. Etudes et analyses Available from: http://www.mutsoc.be/NR/rdonlyres/EB601C3F-C7EC-43C2-B567-0D3A2F04E94B/0/Etudesupplementhopitaux2005.pdf
9. Di Zinno T, Huchon J, Laasman J-M, Vanoverloop J. Coûts hospitaliers : nature, ampleur et évolution des frais à charge du patient hospitalisé en hôpital général. Report. Bruxelles: UNMS; 2006. Etudes et analyses Available from: http://www.mutsoc.be/NR/rdonlyres/40085978-12E4-4C5B-A19D-582A46F7A0D5/0/couts_hospitaliers2006.pdf
10. Ooms D, Puttevils D, Wissels W, Putman K, Corens D, Beeckmans J. Analyse van de factuur ten laste van de patiënt in klassieke hospitalisatie en daghospitalisatie op basis van gekoppelde MKG - MFG. Report. Brussel: Centrum voor Gezondheidseconomie en Ziekenhuisbeleid, Vrije Universiteit Brussel; 2002. Agora-project Available from: http://www.belspo.be/belspo/home/publ/pub_ostc/agora/ragdd009B1_nl.pdf#search=%22agora%20ooms%20%22
11. RIZIV [Homepage on the Internet]. Brussel: RIZIV;c 2006 [cited 2006-09-28]. Forfaitarisering van de farmaceutische specialiteiten in het ziekenhuis. Available from: http://inami.fgov.be/care/nl/hospitals/specific-information/forfaitarisation/index.htm
12. RIZIV [Homepage on the Internet]. Brussel: RIZIV [cited 2006-05-17]. Verrekening van de weigeringen tot toetreding tot het "Akkoord van 19/12/2002", het "Akkoord van 15/12/2003" en het "Akkoord van 20/12/2005. Available from: http://inami.fgov.be/care/nl/doctors/general-information/agreements/2006-2007/pdf/counter-1.pdf
13. Ceuppens A, Corveleyn T, Degauquier K, Vandermeersch G, Vanoverloop J, Widera I. De diabetes conventie. Report. Brussel: IMA-AIM; 2005. Available from: http://www.nic-ima.be/library/documents/evaluation/diabetes/DIAB%20rapport%20NL%20200601.pdf
14. Nederlandstalige Belgische Vereniging voor Nefrologie. Jaarverslag 2003. Report. Edegem: NBVN; 2004. Available from: http://intranet.nbvn.be/file?fle=178#search=%22jaarverslag%202003%20nefrologie%22

15. Berghman J, Meerbergen E. Aanvullende sociale voorzieningen in de tweede en derde pijler. Report. Brussel: Federaal Wetenschapsbeleid; 2005. (AG/01/084) Available from: http://www.belspo.be/belspo_off/home/publ/pub_ostc/agora/ragff084_nl.pdf

16. Harmon C, Nolan B. Health insurance and health services utilization in Ireland. Health Econ. 2001;10(2):135-45.

17. Shmueli A. The effect of health on acute care supplemental insurance ownership: an empirical analysis. Health Econ. 2001;10(4):341-50.

18. Jiménez-Martín S, Lebeaga J, Martínez-Granado M. Latent class versus two-part models in the demand for physician services across the European Union. In: Jones A, O' Donnell O, editors. Econometric analysis of health data. New York: John Wiley & Sons; 2002. p. 101-16.

6 APPENDICES

APPENDIX 1: TECHNISCHE NOTA : BESCHRIJVING VAN DE IMA-GEGEVENS

Deze appendix bevat een beschrijving van de verschillende datasets die door het Intermutualistisch Agentschap (IMA[a]) ter beschikking gesteld zijn[b]. Vervolgens overlopen we de verschillende stappen in de verwerking van deze datasets. Deze stappen hebben betrekking op aanpassingen aan de originele variabelen en op de selectie van het aantal observaties. Het resultaat van deze manipulaties is de finale dataset waarmee de analyses uitgevoerd zijn.

Globaal beeld: steekproeftrekking en datasets

In deze sectie overlopen we de steekproeftrekking en de datasets die gebruikt worden in de analyse.

Steekproeftrekking

In onze datasets hebben we een representatieve steekproef uit de volledige Belgische populatie ter beschikking. De individuen werden met een kans van 1/40 uit de totale populatie getrokken. Om een duidelijker beeld te krijgen van de profielen van de oudere bevolking werd verder een extra steekproef getrokken van personen van 65 of ouder, opnieuw met een kans van 1/40. In totaal heeft deze groep ouderen een kans van 1/20 om in onze steekproef aanwezig te zijn.

De steekproefpersonen in de dataset van 2002 en 2003 zijn dezelfde personen (= een panel). Om de dynamica van de bevolking (geboorte, sterfte, migratie) te weerspiegelen komen er mensen bij of verdwijnen ze uit de steekproef. Pasgeborenen en immigranten worden geselecteerd met een kans van 1/40, waarbij immigranten van +65 een kans krijgen van 1/20. Ten tweede worden personen die in 2003 de leeftijd van 65 jaar bereiken en die niet in de steekproef van 2002 aanwezig waren, geselecteerd met een kans van 1/40. Verder kunnen we ook zien in welk jaar en welke maand een persoon gestorven is. We weten niet exact wanneer iemand geëmigreerd of geïmmigreerd is.

Om geen vertekening te krijgen in de analyses door de oververtegenwoordiging van 65-plussers, werken we steeds met de respectieve gewichten.

Naast deze individuen in de populatiedataset hebben we ook nog hun MaF (maximumfactuur)-familieleden. Een MaF-gezin bestaat uit alle personen die op 1 januari van het jaar van de toekenning van de MaF op hetzelfde adres in het Rijksregister zijn ingeschreven. Hierbij wordt geen onderscheid gemaakt tussen gehuwden en samenwonenden. Wijzigingen in de samenstelling van het gezin die zich in de loop van een jaar voordoen, worden niet in rekening gebracht. Er zijn echter uitzonderingen op deze algemene regel. Volgende personen kunnen toch een apart gezin vormen[c]:

---

[a] Deze datalevering kadert in de doelstelling van het IMA zoals vastgelegd in de programmawet van 24/12/2002, namelijk de door de verzekeringsinstellingen verzamelde gegevens analyseren in het kader van hun wettelijke opdrachten in relatie tot de verplichte ziekteverzekering en de informatie hieromtrent verstrekken.

[b] Deze beschrijving is sterk gebaseerd op het auditoraatsrapport van het Federaal Kenniscentrum voor de Gezondheidszorg voor het Sectoraal comité van de sociale zekerheid (KCE, 2005).

[c] De Maximumfactuur (MAF). In: Studies en onderzoek -Thematische uiteenzettingen. Brussel: RIZIV; 2002. p. 111-21. Available from: http://inami.fgov.be/information/nl/studies/study15/index.htm

- personen die in een gemeenschap leven (bv. hoofdverblijfplaats in een rustoord voor bejaarden, psychiatrisch ziekenhuis, gevangenis, kloostergemeenschap...). Personen van wie de echtgeno(o)t(e) en/of personen ten laste in dezelfde gemeenschap gedomicilieerd zijn vormen wel samen een feitelijk gezin;
- de gerechtigde die in een gastgezin is geplaatst;
- personen in een afhankelijkheidssituatie (bv. chronisch zieken). Zij kunnen kiezen om al dan niet een apart gezin te vormen als zij daarmee voordeel doen.

Algemene beschrijving van de datasets

In totaal hebben we 4 datasets ontvangen voor de jaren 2002 en 2003. Twee datasets bevatten populatiekenmerken, de andere twee uitgavengegevens:

- dm_popstpr_:
  - socio-economische en demografische gegevens
  - voor een representatieve steekproef
  - op het niveau van de rechthebbende
  - toestand op 30/06 en 31/12, aangevuld met de overledenen van het betreffende semester
- dm_popfam_:
  - zelfde populatiekarakteristieken als in dm_popstpr
  - voor de MaF-familieleden van de individuen uit de steekproef
- catagg:
  - informatie over de medische consumptie van de individuen in dm_popstpr_
  - factureringsgegevens en Farmanet
  - geaggregeerd per patiënt en per zorgcategorie
  - zowel kwartaal- als jaargegevens
  - voor ZIV-terugbetalingen, remgelden en supplementen
- catsej:
  - informatie over de medische consumptie van de individuen in dm_popstpr in het kader van een hospitalisatie (daghospitalisatie inbegrepen)
  - geaggregeerd per patiënt, per hospitalisatie en per zorgcategorie
  - enkel jaargegevens
  - voor ZIV-terugbetalingen, remgelden en supplementen

Naast deze gegevens hebben we ook een aparte dataset met beperkte informatie over de ziekenhuizen. We beschikken echter niet over informatie omtrent de pathologiegegevens (Minimale Klinische Gegevens - MKG).

Datasets met populatiekarakteristieken: dm_popstpr en dm_popfam

Observaties

In deze datasets wordt elk individu 2 maal geregistreerd: een eerste maal in juni en een tweede maal in december. Uitzonderingen hierop zijn degenen die gestorven, geboren, geëmigreerd of geïmmigreerd zijn tussen de tijdsintervallen. In de volgende twee tabellen wordt het aantal individuen weergegeven op de respectieve tijdstippen.

Tabel 1: Aantal observaties in dm_popstpr

	2002	2003
juni	298,521	300,667
december	298,370	300,587

Tabel 2: Aantal observaties in dm_popfam

	2002	2003
juni	537,051	538,265
december	538,939	540,361

Variabelen

We overlopen alle variabelen die in de populatiegegevens van het IMA zitten en die we in de analyses opgenomen hebben. Sommige variabelen in de analyses komen rechtstreeks uit de originele dataset, voor andere waren manipulaties nodig, zoals het omzetten van een categorische variabele in een dummy variabele. Voor meer details verwijzen we naar het rapport van de gegevensaanvraag (KCE, 2005) en naar een document van IMA (IMA, Gegevens Populatie Layout, versie 2.1, 2004). In onderstaand overzicht gebruiken we de naam van de variabele zoals in de lay-out van het IMA. In appendix 3 geven we voor elke variabele de naam in de lay-out van het IMA, de naam zoals gebruikt in de analyses in hoofdstuk 2 en een omschrijving.

PP0010

Identificatienummer van de rechthebbende. Dit is een unieke code voor elk individu in de dataset.

PP0015 en PP0020

PP0015 is het geboortejaar van het individu. Hiervan maken we een nieuwe variabele met de leeftijd zelf, bestaande uit het verschil tussen het jaartal van de dataset en PP0015. Verder hebben we deze variabele ingedeeld in leeftijdscategorieën van 5 jaar, behalve voor de jongste kinderen. Daarbij laten we ook de interactie toe met het geslacht. Enkele voorbeelden van de aldus gevormde categorieën zijn: L0M (man, leeftijd 0 jaar), L1_5M (man, leeftijd van 1 tot 5 jaar – bovengrens niet inbegrepen), L5_10M (man, leeftijd van 5 tot 10 jaar – bovengrens niet inbegrepen). Voor vrouwen gaan we op analoge wijze te werk. De hoogste leeftijdscategorie is 95 jaar en ouder en dit zowel voor mannen als voor vrouwen.

PP0025

De NIS-code bestaat uit 5 cijfers: Provincie – Arrondissement - Gemeente

- Eerste cijfer = de provincie
- Eerste twee cijfers = het arrondissement

- Totale code = de gemeente
- Code 00000 = het individu is 'in het buitenland' of onbekend

Op basis van deze variabele maken we een nieuwe variabele aan voor de provincies en het buitenland waarbij we de NIS-codes aggregeren. Daarna splitsen we deze in dummies per categorie.

- Buitenland of onbekend: PP0025=0 (prov=0)
- Antwerpen: 11000<PP0025<13500 (prov=1)
- Vlaams Brabant: 23000<PP0025<24500 (prov=2)
- West-Vlaanderen: 31000<PP0025<38500 (prov=3)
- Oost-Vlaanderen: 41000<PP0025<46500 (prov=4)
- Limburg: 71000<PP0025<73500 (prov=5)
- Brussel: 21000<PP0025<21500 (prov=6)
- Waals-Brabant - Brabant Wallon: 25000<PP0025<25500 (prov=7)
- Henegouwen - Hainaut: 51000<PP0025<57500 (prov=8)
- Luik - Liège: 61000<PP0025<64500 (prov=9)
- Luxemburg - Luxembourg: 81000<PP0025<85500 (prov=10)
- Namen - Namur: 91000<PP0025<93500 (prov=11)

Opmerking

De variabele is gelijk aan '0' indien 'buitenland'. Deze groep personen is echter niet precies definieerbaar. Enerzijds zitten in deze categorie de mensen die in het buitenland verblijven, en anderzijds werd de code '0' ook toegekend aan personen waarvan de NIS-code niet bekend is. Deze personen sluiten we uit in de analyses. Het gaat om 4,868 personen[d] met de volgende (gewogen) kenmerken voor uitgaven. Opvallend is hun zeer hoog gemiddelde aan ZIV-terugbetalingen van €2,488. Ze betalen gemiddeld ongeveer €121 aan remgeld en €67 aan supplementen.

Tabel 3: Uitgaven van individuen met NIS-code gelijk aan buitenland of onbekend

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	2,448.57	40,859.63	0.00	178,270.72	359,498,851.00
totss00160	120.93	1,820.42	0.00	5,572.55	17,755,410.20
totss00165	66.54	1,624.52	0.00	7,106.75	9,769,749.40

Hun populatiekarakteristieken tonen aan dat ongeveer 51% actief (KG1_01) is, 25% is gepensioneerd (KG1_03), 8,2% is weduwe(naar) en 6,5% niet verzekerd (NV). 15,4% geniet van een verhoogde tegemoetkoming. In deze groep heeft 2,5% recht op kinesitherapie E of fysiotherapie (pp2003) en heeft 3,8% recht op toelage voor hulp aan ouderen (pp2006). Verder heeft 4,9% recht op een toelage voor gehandicapten (pp3011).

[d] De bedragen en aantallen komen uit de finale dataset voor 2003 (zie verder), dus na koppeling van de gegevens en na de nodige datamanipulatie. Ook voor meer gedetailleerde uitleg over de verschillende variabelen bij de beschrijvende statistieken verwijzen we naar het vervolg van deze sectie. We geven enkel de variabelen weer die ook in de analyses worden gebruikt. Het gaat telkens om dummy- variabelen (0-1 variabelen).

Tabel 4: Populatiekenmerken van individuen met NIS-code gelijk aan buitenland of onbekend

Variable	Mean	Std Dev
KG1_00_10080	0.0046	0.3729
KG1_00_10081	0.0256	0.8676
KG1_01	0.5100	2.7456
KG1_02tit	0.0241	0.8425
KG1_02ptl	0.0072	0.4650
KG1_mindervptl	0.0010	0.1695
KG1_03	0.2524	2.3859
KG1_04	0.0819	1.5058
KG1_05	0.0005	0.1282
KG1_07	0.0011	0.1812
ZR_zonderKR	0.0492	1.1876
ZR_metKR	0.0210	0.7871
NV	0.0650	1.3538
verhteg	0.1542	1.9835
PP2001	0.0113	0.5807
PP2002	0.0097	0.5375
PP2003	0.0247	0.8517
PP2004	0.0000	0.0000
PP2005	0.0035	0.3263
PP2006	0.0379	1.0484
PP2007	0.0034	0.3200
PP2008	0.0008	0.1570
PP2009	0.0000	0.0000
PP2010	0.0169	0.7078
PP2011	0.0148	0.6643
PP1004_werkloos	0.0198	0.7643
PP1004_deeltijds	0.0005	0.1282
PP1004_brug	0.0016	0.2219
PP1004_rest	0.9781	0.8044
PP0040B_kw1	0.0847	1.5295
PP0040B_kw2	0.0016	0.2219
PP0040B_kw3	0.0010	0.1695
PP0040B_kw4	0.0003	0.0906

PP3011	0.0489	1.1845
PP3012	0.0128	0.6175
PP3010_3013_tot60	0.0054	0.4043
PP3010_3013_va60	0.0208	0.7846
PP4002_d	0.0253	0.8631

PP0030, PP0035, PP1003 en PP1008

- PP0030/PP0035: verzekeringsstatus voor respectievelijk grote en kleine risico's (KG1/KG2).
- PP1003: Sociale toestand (actieve arbeider – incl. werklozen en invaliden, actieve bediende – incl. werklozen en invaliden, statutair tewerkgestelden van de openbare sector, actieve zelfstandigen met inbegrip van de invalide zelfstandigen+geassimileerde zelfstandigen, mindervaliden van de algemene en zelfstandigenregeling, studenten derde niveau, ...)
- PP1008: Aard/bedrag inkomen (personen in het genot van een bestaansminimum of gelijkwaardig voordeel, personen met een inkomen <=12 keer het bestaansminimum voor gezinshoofden, personen die een volledige bijdrage betalen, personen met een jaarlijks belastbaar bruto-gezinsinkomen <1,000,000 BEF (ongeveer €24,789), personen met een inkomen < grensbedrag voor WIGW's (weduwen, invaliden, gepensioneerden en wezen), niet van toepassing)

Op basis van deze variabelen maken we verschillende dummies die het sociaal verzekeringsstatuut van een individu weergeven.

Algemene regeling versus regeling zelfstandigen versus niet-verzekerden

Het eerste cijfer van PP0030 geeft weer of een persoon voor de grote risico's behoort tot de algemene regeling (eerste cijfer=1) of tot de regeling van de zelfstandigen (eerste cijfer=4). Aangezien de regelgeving voor grote risico's dezelfde is voor beide groepen, is er geen verschil in terugbetaling van zorg en maken wij geen onderscheid tussen zelfstandigen en anderen.

We maken wel een onderscheid tussen zelfstandigen en algemene regeling voor de kleine risico's (dat wordt weergegeven door het eerste cijfer van PP0035) omdat hiervoor wel een ander terugbetalingsregime bestaat. Binnen de groep van de zelfstandigen zijn er nog drie subgroepen. Enerzijds zijn er de zelfstandigen met recht op kleine risico's door hun hoedanigheid. Een voorbeeld is de code grote/kleine risico's 410/130 waarbij het individu onder de regeling van de zelfstandigen valt voor de grote risico's (410) en tegelijk zijn rechten als ex-gepensioneerde (of persoon ten laste of ex-persoon ten laste van gepensioneerde) van de algemene regeling behoudt (130). De tweede groep van zelfstandigen heeft geen recht op kleine risico's (bv. 410/000). En de laatste en tevens grootste groep van zelfstandigen sluit vrijwillig een vrije verzekering af waardoor ze toch gedekt worden voor kleine risico's (bv. 410/900). Het onderscheid tussen zelfstandigen en algemene regeling zal echter geleidelijk verdwijnen. Vanaf 1 juli 2006 zullen startende zelfstandigen en personen met inkomensgarantie voor ouderen een volledige dekking krijgen binnen de verplichte verzekering. Voor de andere zelfstandigen geldt deze maatregel vanaf 1 januari 2008.

Wanneer het eerste cijfer van PP0030 een 0 is, betekent dit dat de persoon niet verzekerd is.

Opmerking

Voor de zelfstandigen die geen recht hebben op kleine risico's binnen de verplichte verzekering hebben we geen gegevens in de dataset 'catagg' omtrent de ambulante uitgaven. Om aldus een vertekening van de resultaten te vermijden, sluiten we deze uit bij alle analyses. We nemen die groep wel onder de loep in een aparte sectie.

Opmerking

Individuen met verzekeringstatus 0 of 'niet verzekerd' nemen we niet op in de analyses. Dit is een groep van personen die niet in orde is inzake verzekerbaarheid en dus geen rechten heeft in het ziekteverzekeringsstelsel. In principe mogen zij dus geen uitgaven genereren. In realiteit is dit echter niet zo evident aangezien velen nog een geldige SIS-kaart bezitten. Het ziekenfonds heeft betalingsplicht zelfs wanneer de rechten intussen vervallen zijn. Het gaat om 1,397 personen met onderstaande gewogen kenmerken. Zij betalen gemiddeld slechts €0.95 aan supplementen, €7.92 aan remgeld en krijgen €67 terug van het RIZIV.

Tabel 5: Uitgaven van individuen met verzekeringsstatus onbekend of niet verzekerd

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	67.00	3,552.35	0.00	16,645.10	3,628,617.20
totss00160	7.92	245.45	0.00	738.99	428,715.80
totss00165	0.95	82.85	0.00	376.26	51,283.60

27,5% woont in Brussel (prov_06) en 17,6% in het buitenland (of onbekend). Slechts enkelen hebben recht op het forfait kinesitherapie E of fysiotherapie, op een toelage voor integratie van gehandicapten (beiden 0,15%), of op uitkering hulp aan derden (0,04%). 2,6% is werkloos.

Tabel 6: Populatiekenmerken van individuen met verzekeringsstatus onbekend of niet verzekerd

Variable	Mean	Std Dev
prov_00	0.1761	2.3728
prov_01	0.0990	1.8600
prov_02	0.0665	1.5516
prov_03	0.0410	1.2349
prov_04	0.0543	1.4113
prov_05	0.0417	1.2455
prov_06	0.2751	2.7815
prov_07	0.0388	1.2025
prov_08	0.0768	1.6586
prov_09	0.0853	1.7399
prov_10	0.0162	0.7875
prov_11	0.0292	1.0482
PP2001	0.0000	0.0000
PP2002	0.0000	0.0000
PP2003	0.0015	0.2392
PP2004	0.0000	0.0000
PP2005	0.0015	0.2392
PP2006	0.0000	0.0000
PP2007	0.0004	0.1197
PP2008	0.0000	0.0000
PP2009	0.0000	0.0000
PP2010	0.0000	0.0000
PP2011	0.0000	0.0000
PP1004_werkloos	0.0266	1.0020
PP1004_deeltijds	0.0007	0.1692
PP1004_brug	0.0000	0.0000
PP1004_rest	0.9727	1.0155
PP0040B_kw1	0.0000	0.0000
PP0040B_kw2	0.0000	0.0000
PP0040B_kw3	0.0000	0.0000
PP0040B_kw4	0.0000	0.0000
PP0040B_dood	0.0000	0.0000
PP3011	0.0030	0.3380

Variable	Mean	Std Dev
PP3012	0.0258	0.9884
PP3010_3013_tot60	0.0236	0.9462
PP3010_3013_va60	0.0030	0.3380
PP4002_d	0.0059	0.4774

Gerechtigden van het Rijksregister

Voor deze personen geldt dat het tweede cijfer van PP0030=0. Dit is echter een zeer heterogene groep en we maken op basis van PP1008 (aard/bedrag inkomen) nog verder onderscheid tussen diegenen die wel en niet een bijdrage moeten betalen. We construeren 2 variabelen binnen deze groep:

- KG1_01_pp10080: tweede cijfer PP0030=0 en PP1008=0 (niet van toepassing)
- KG1_01_pp10081: tweede cijfer PP0030=0 en PP1008 niet gelijk aan 0

Actieven

Het tweede cijfer van PP0030=1.

Invaliden

Het tweede cijfer van PP0030=2. Men wordt invalide nadat men minstens 1 jaar arbeidsongeschikt was. De periode van invaliditeit kan ook eindigen (bv. wanneer de persoon in kwestie opnieuw begint te werken).

Binnen de groep van invaliden maken we verder het onderscheid tussen de personen ten laste (obv PP1002, zie verder) en de titularissen.

Mindervaliden

In tegenstelling tot de invaliden hebben mindervaliden niet noodzakelijk gewerkt. Er zijn verschillende criteria waardoor men mindervalide verklaard kan worden (bv. recht op verhoogde kinderbijslag, erkend door een geneesheer - inspecteur,...). Aan de hand van de variabele sociaal statuut (PP1003) weten we of iemand mindervalide is van de algemene regeling (PP1003=5) of van de regeling van zelfstandigen (PP1003=6). Wij maken dit onderscheid niet omdat de mindervaliden in beide regelingen op dezelfde wijze behandeld worden. Wel splitsen we opnieuw de personen ten laste en de titularissen.

Gepensioneerden

Het tweede cijfer van PP0030=3.

Weduwen(aar)

Het tweede cijfer van PP0030=4.

Wezen

Het tweede cijfer van PP0030=5.

Kloostergemeenschappen

Het tweede cijfer van PP0030=7.

Opmerking

De 126 personen die in deze categorie zitten, laten we uit onze analyses weg wegens een te klein aantal. Echter, ook bij de volgende tabellen mogen de resultaten niet veralgemeend worden omdat het over slechts weinig observaties gaat waardoor onze steekproef niet representatief is voor die groep in de totale Belgische bevolking. In onze steekproef krijgen

zij gemiddeld genomen €1,221 terug van het RIZIV en betalen €60.5 en €67.6 aan respectievelijk remgeld en supplementen.

Tabel 7: Uitgaven van leden van een kloostergemeenschap

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	1221.41	12889.85	0	15815.04	3,664,225
totss00160	60.4556	565.1323	0	489.22	181,367
totss00165	67.606	963.0641	0	1389.39	202,818

Hun populatiekenmerken geven aan dat 21% in de provincie Antwerpen woont, 5% heeft de code 'buitenland of onbekend'. Bijna 5% stierf gedurende 2003. Opmerkelijk is dat de grote meerderheid (65,3%) recht heeft op verhoogde tegemoetkoming. Dit verklaart wel meteen het laag gemiddelde voor het te betalen remgeld binnen deze groep.

Tabel 8: Populatiekenmerken van leden van een kloostergemeenschap

Variable	Mean	Std Dev
prov_00	0.0533	1.1008
prov_01	0.2133	2.0069
prov_02	0.1333	1.6653
prov_03	0.1000	1.4697
prov_04	0.0933	1.4251
prov_05	0.0800	1.3291
prov_06	0.0667	1.2220
prov_07	0.0133	0.5619
prov_08	0.0867	1.3783
prov_09	0.0467	1.0333
prov_10	0.0333	0.8794
prov_11	0.0800	1.3291
PP2001	0.0067	0.3987
PP2002	0.0000	0.0000
PP2003	0.0133	0.5619
PP2004	0.0000	0.0000
PP2005	0.0000	0.0000
PP2006	0.0333	0.8794
PP2007	0.0000	0.0000
PP2008	0.0000	0.0000
PP2009	0.0000	0.0000
PP2010	0.0000	0.0000
PP2011	0.0000	0.0000
PP1004_werkloos	0.0000	0.0000
PP1004_deeltijds	0.0000	0.0000
PP1004_brug	0.0000	0.0000
PP1004_rest	1.0000	0.0000
PP0040B_kw1	0.0000	0.0000
PP0040B_kw2	0.0267	0.7893
PP0040B_kw3	0.0133	0.5619
PP0040B_kw4	0.0067	0.3987
PP3011	0.0267	0.7893
PP3012	0.0000	0.0000
PP3010_3013_tot60	0.0000	0.0000

Variable	Mean	Std Dev
PP3010_3013_va60	0.5667	2.4276
PP4002_d	0.0133	0.5619

Recht op verhoogde tegemoetkoming

Op basis van het laatste cijfer van PP0030 zien we wie al dan niet een verhoogde tegemoetkoming heeft voor grote risico's (1=verhoogde tegemoetkoming, 0= geen verhoogde tegemoetkoming).

Opmerking

De volgende combinaties uit de dataset kunnen in principe niet voorkomen: '110900', '130900', '420110', '420900', '430131' en '430430'. Deze, samen met de codes '110787', '410787' en '430803' met betrekking tot internationale akkoorden, zetten we op '999999' en sluiten we uit in onze analyses. Het gaat om slechts 37 individuen, dus ook hier moeten we opletten met extrapolatie. Uit de tabellen blijkt dat zij gemiddeld €12.4 aan supplementen betalen. Hun gemiddelde remgelden bedragen €31.2 en de gemiddelde ZIV-terugbetalingen €147.

Tabel 9: Uitgaven van individuen met niet-bestaande codes voor verzekeringsstatus of met codes voor internationale akkoorden

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	147.0406	4726.94	0	5956.01	2,058,578
totss00160	31.19943	813.5371	0	762.79	43,680
totss00165	12.36429	612.7262	0	828.12	17,310

De gewogen populatiekarakteristieken tonen aan dat niemand van hen recht heeft op een forfait voor chronisch zieken (pp2001-pp2011). 88,5% heeft de code 0 voor PP0025 (onbekende NIS-code of in het buitenland), 7% woont in Limburg (prov_05). De overige niet-verzekerden uit onze steekproef zijn verdeeld over Vlaams Brabant (prov_02) en Namen (prov_11) met respectievelijk bijna 3% en 1,5%. Tenslotte is 2,8% minstens 1 dag arbeidsongeschikt geweest in de loop van 2003 (pp4002_d).

Tabel 10: Populatiekenmerken van individuen met niet-bestaande codes voor verzekeringsstatus of met codes voor internationale akkoorden

Variable	Mean	Std Dev
prov_00	0.8857	1.9841
prov_01	0.0000	0.0000
prov_02	0.0286	1.0389
prov_03	0.0000	0.0000
prov_04	0.0000	0.0000
prov_05	0.0714	1.6060
prov_06	0.0000	0.0000
prov_07	0.0000	0.0000
prov_08	0.0000	0.0000
prov_09	0.0000	0.0000
prov_10	0.0000	0.0000
prov_11	0.0143	0.7400
PP2001	0.0000	0.0000
PP2002	0.0000	0.0000
PP2003	0.0000	0.0000
PP2004	0.0000	0.0000
PP2005	0.0000	0.0000
PP2006	0.0000	0.0000
PP2007	0.0000	0.0000
PP2008	0.0000	0.0000
PP2009	0.0000	0.0000
PP2010	0.0000	0.0000
PP2011	0.0000	0.0000
PP1004_werkloos	0.0000	0.0000
PP1004_deeltijds	0.0000	0.0000
PP1004_brug	0.0000	0.0000
PP1004_rest	1.0000	0.0000
PP0040B_kw1	0.0000	0.0000
PP0040B_kw2	0.0000	0.0000
PP0040B_kw3	0.0000	0.0000
PP0040B_kw4	0.0000	0.0000
PP3011	0.0000	0.0000
PP3012	0.0000	0.0000

Variable	Mean	Std Dev
PP3010_3013_tot60	0.0000	0.0000
PP3010_3013_va60	0.0000	0.0000
PP4002_d	0.0286	1.0389

PP0040B

Van deze variabele maken we dummies voor de overledenen waarbij we de maand van overlijden aggregeren tot het kwartaal van overlijden.

PP1001

De variabele geeft weer of het individu wordt geteld in de modellen E of niet. Wij gebruiken dit enkel in het kader van recuperatie van gegevens van vroegere periodes (zie beschrijving finale dataset).

PP1002

Deze variabele omvat volgende categorieën: titularis, echtgeno(o)t(e) of samenwonende ten laste, descendent, of ascendent. Hiervan nemen we de laatste drie categorieën samen en definiëren deze groep als "persoon ten laste".

Verder laten we deze variabele interageren met de verzekeringsstatus voor de categorieën van invaliden en mindervaliden.

Opmerking

3 personen hebben een waarde 0 voor deze variabele. Zij hebben alle drie een leeftijd van 65 jaar in de dataset van 06 2003, en komen niet voor in de dataset van 12 2002. Ze werden dus bijgetrokken. Bovendien sterven zij in het eerste semester van 2003 zodat we niet alle informatie hebben. Dit is ook zo voor deze variabele, die op 0 gezet wordt voor overledenen. Deze 3 personen behoren tot de gepensioneerden (PP0030=130 of 131). Omdat de variabele PP1002 enkel gebruikt wordt in interactie met de invaliden/mindervaliden, kunnen we deze 3 personen toch in de analyses opnemen.

PP1004

Dit is een variabele voor de werkloosheidstatus indien het individu werkloos was in het 4e kwartaal van voorafgaand jaar. Er zijn heel wat categorieën (geen toelating tot uitbetalen, volledige werkloosheid-voltijdse werknemer, tijdelijke werkloosheid-voltijdse werknemer, volledige werkloosheid-vrijwillig deeltijdse werknemer, brugpensioen, jeugdvakantiedagen...). Voor verschillende van deze categorieën is het aantal individuen zeer beperkt of zelfs nul. Daarom beslissen we om de categorieën in deze variabele te reduceren tot 4 dummies:

- PP1004_werkloos: categorie 0, 1, 3, 6 en 11. Hierin zitten de individuen die volledig werkloos zijn.
- PP1004_deeltijds: categorie 4, 5 en 18: personen die deeltijds werkloos zijn en deeltijds werken.
- PP1004_brug: categorie 9, 10 en 15: personen met voltijds of deeltijds brugpensioen.
- PP1004_rest: categorie 2, 12, 21 en alle missings: alle niet werklozen. Hierin zitten zowel actieven als gepensioneerden.

De andere categorieën uit de lay-out van het IMA komen niet voor in onze dataset.

Opmerking

In de originele dataset hebben alle niet-werklozen een missing value. Dit houdt in dat zowel actieven als gepensioneerden in dezelfde 'categorie' vallen. Wij gaan die niet verder uitsplitsen.

Forfaits

In de dataset zitten ook indicatoren of iemand recht heeft op een bepaald forfait. We weten dus niet of die persoon ook daadwerkelijk het betreffende zorgforfait ontvangen heeft. Dit wordt bepaald door de hoogte van de remgelden die betaald werden gedurende de voorbije twee jaar.

- PP2001: Forfait B verpleegkundige zorgen
- PP2002: Forfait C verpleegkundige zorgen
- PP2003: Kinesitherapie E of fysiotherapie
- PP2004: Verhoogde kinderbijslagen
- PP2005: Toelage voor de integratie van gehandicapten (categorie 3 of 4)
- PP2006: Toelage voor hulp aan ouderen (categorie 3, 4 of 5)
- PP2007: Uitkering hulp aan derden
- PP2008: Uitkering voor primaire arbeidsongeschiktheid of invaliditeitsuitkering
- PP2009: Forfaitaire uitkering hulp aan derden

Opmerking

Het kan niet voorkomen dat een persoon tegelijk recht heeft op forfait B (PP2001) en forfait C (PP2002). Daardoor zetten we voor al degenen bij wie dit wel het geval is de variabele PP2001 op nul.

Variabelen met betrekking tot de maximumfactuur (MaF):

- PP3004: indicator of er MaF terugbetalingen gebeurd zijn volgens een plafond van €450 of €650 of geen terugbetalingen. Deze variabele is op gezinsniveau gedefinieerd.
- PP3009: nummer gezinshoofd MaF

PP3010 en PP3013

Deze twee variabelen staan voor "recht op gewaarborgd inkomen, inkomensgarantie voor oudere of op het leefloon" en "recht op hulp van OCMW". We nemen ze samen omdat de inhoud van beide variabelen quasi hetzelfde is. We maken hier 2 dummy-variabelen aan die aangeven of PP3010 of PP3013 verschillend is van nul of niet in combinatie met of de persoon ouder is dan 60 of niet (PP3010_3013_tot60 en PP3010_3013_va60).

PP3011

De persoon heeft al dan niet een "recht op toelage van gehandicapten" in het referentiejaar (in ons geval dus 2003).

PP3012

De variabele PP3012=1 als de rechthebbende voor het beschouwde jaar gecontroleerd werkloos is voor de toepassing van de verplichte verzekering voor geneeskundige verzorging en uitkeringen. In 2002 moet hij/zij bovendien sinds tenminste 6 maanden de

hoedanigheid van volledig werkloze hebben zoals bedoeld in de werkloosheidsreglementering (overgangsmaatregel) of sinds tenminste 1 jaar werkloos zijn en ouder dan 50 jaar. Vanaf 2003 moet de persoon tenminste 1 jaar werkloos zijn en ouder dan 50.

PP4002

De variabele PP4002 geeft het aantal dagen dat het individu arbeidsongeschikt was gedurende het referentiejaar. Periodes van moederschap- en vaderschapsverlof worden hierbij niet mee opgeteld, alsook periodes die niet vergoed werden door de verzekeringsinstelling. Van deze variabele maken we een dummy om aan te duiden of het aantal dagen arbeidsongeschiktheid verschillend is van nul of niet.

Datasets met informatie over medische consumptie: catagg en catsej

Beide datasets bevatten informatie over de medische consumptie van factureringsgegevens en van Farmanet en omvatten een boekingsperiode van 18 maanden (jaar t en het eerste semester van jaar t+1).

Aggregatieniveau van medische consumptie

De informatie is, met uitzondering van slechts enkele categorieën (bv. geneesmiddelen A), niet op het niveau van de nomenclatuurcode maar op een hoger, geaggregeerd, niveau. De basis voor de aggregatie is het niveau van de boekhoudcode of een groep van boekhoudcodes. Soms kan daarvan afgeweken worden, maar wel worden volgende principes in het achterhoofd gehouden:

- Er wordt een onderscheid gemaakt tussen ambulante zorg en zorg verstrekt in het kader van een hospitalisatie op basis van het vierde cijfer van de boekhoudcode. Alleen daar waar het niet mogelijk was, werd geen splitsing gemaakt. Aldus ontstaan er een aantal gemengde codes op het geaggregeerde niveau. De gemengde codes omvatten revalidatie en herscholing, implantaten, paramedisch materiaal, wachtdienst en toezicht, diverse kosten, medisch pediatrische centra en kamersupplementen.
- Er wordt steeds rekening gehouden met het al dan niet van toepassing zijn van remgeld en/of supplementen voor de nomenclatuurcodes per (groep van) boekhoudcode(s).
- In de geaggregeerde codes tellen de remgelden volledig wel of volledig niet mee voor de maximumfactuur.
- Ingeval van een specifieke (chronische) aandoening worden de nomenclatuurcodes niet geaggregeerd zodat deze categorieën apart gedefinieerd blijven.

Op die manier ontstaan er ongeveer 250 categorieën. Het spreekt vanzelf dat voor de meeste individuen in de steekproef er slechts een beperkt aantal van deze categorieën ingevuld zijn. Daarom is het noodzakelijk nog verder te aggregeren (zie verder).

Opmerking

Niet alle categorieën komen voor in 2002 en in 2003. Zo wordt bijvoorbeeld “tegemoetkoming voor haarprothesen” in 2003 als een aparte categorie beschouwd bij de geneesmiddelen.

Consumptiegegevens per kwartaal: catagg

De dataset 'catagg' bevat informatie over de uitgaven voor gezondheidszorg per individu en per geaggregeerde categorie. Variabelen in deze dataset zijn:

- ss00010: identificatienummer van de gerechtigde
- cat: aggregatiecategorie
- ss00050_1 tot ss00050_4: kwartaalgegevens van het aantal prestaties
- ss00055_1 tot ss00055_4: kwartaalgegevens van het aantal dagen
- ss00060_1 tot ss00060_4: kwartaalgegevens van de ZIV-terugbetalingen
- ss00160_1 tot ss00160_4: kwartaalgegevens van het te betalen remgeld
- ss00165_1 tot ss00165_4: kwartaalgegevens van de te betalen supplementen
- ss00050, ss00055, ss00060, ss00160, ss00165: jaargegevens als de som van de kwartalen

De gegevens in deze dataset betreffen zowel ambulante uitgaven als kosten gemaakt in het kader van een hospitalisatie.

Aantal observaties in catagg

Indien een individu bijvoorbeeld op consultatie naar de huisarts gaat en hij consumeert bovendien ook geneesmiddelen binnen één bepaalde categorie, dan wordt hij 2 maal geregistreerd in deze dataset. Bijgevolg hebben we een zeer grote dataset met respectievelijk 3,259,566 en 3,449,682 observaties in 2002 en 2003. De datasets die volgen uit een aggregatie naar het niveau van de patiënt bevatten 275,090 observaties in 2002 en 277,567 observaties in 2003. Het verschil tussen het aantal observaties in deze datasets met het aantal in de steekproef, zijn de mensen zonder consumptie van zorg.

Consumptie per ziekenhuisopname: catsej

Deze dataset bevat meer gedetailleerde informatie over de uitgaven op hospitalisatieniveau. Daar waar 'catagg' enkel geaggregeerde gegevens op kwartaal- of jaarbasis heeft, beschikken we in 'catsej' over uitgaven per hospitalisatie (zowel daghospitalisatie als hospitalisatie van langere duur).

We beschikken over de volgende informatie:

- id: identificatienummer van de gerechtigde
- ss00050, ss00055, ss00060, ss00160, ss00165: jaargegevens zoals in de dataset 'catagg'
- datdeb en datfin: begin- en einddatum van de hospitalisatie
- cat: aggregatiecategorie
- serv: dienstcode
- typchamb: indicator voor het type van de kamer (één-, twee- of meer-persoons kamer)
- codhop: nummer van ziekenhuis

Aantal observaties in catsej

Ook hier wordt een patiënt meerdere malen geregistreerd wanneer deze behandelingen kreeg uit verschillende categorieën en/of verschillende keren opgenomen werd. In de dataset catsej hebben we 1,057,715 en 1,103,607 lijnen in 2002 en 2003 respectievelijk. Als we dit aggregeren tot het niveau van de patiënt, bekomen we 54,707 en 56,624 observaties. Dit is het aantal patiënten uit onze steekproef dat gehospitaliseerd (inclusief daghospitalisatie) geweest is in 2002 en 2003. Ze hebben samen 95,626 opnames in 2002 en 99,260 opnames in 2003 gehad.

Opmerking

De som van de uitgaven over de verschillende opnames per patiënt zou hetzelfde moeten zijn als de uitgaven met betrekking tot hospitalisaties die geregistreerd werden in 'catagg'. Dit is echter niet altijd het geval. De reden hiervoor is dat prestaties voor opnames na de middag en voor ontslagen vóór de middag niet gefactureerd worden en aldus niet in 'catsej' zitten. Anderzijds zijn de gegevens in 'catsej' veel gedetailleerder dan in 'catagg' waar we enkel over de geaggregeerde gegevens op kwartaal- of jaarbasis en niet per hospitalisatie beschikken. Daarom zullen we voor uitgaven in het kader van een hospitalisatie werken met gegevens uit 'catsej'. Voor alle ambulante uitgaven en om een totaalbeeld te schetsen werken we wel met 'catagg'.

Opmerking

In de dataset 'catsej' zitten ook ambulante uitgaven. Een opname wordt gedefinieerd als een 'klassieke opname' als het een verblijf van langere duur binnen dezelfde instelling of ziekenhuis betreft (korte onderbrekingen zoals een weekend of vakantiedagen worden niet in rekening gebracht). Het kan dus voorkomen dat 1 of meerdere daghospitalisaties na elkaar samengevoegd worden tot 1 klassieke hospitalisatie.

Variabelen

In deze subsectie overlopen we alle wijzigingen die we aangebracht hebben in de datasets van de uitgaven.

Algemeen

Voor de uitgaven zien we dikwijls heel kleine (en ook negatieve) bedragen. We hebben alle bedragen in het interval]-0.01,0.01[omgezet naar 0.

Kamertype van hospitalisatie

Het kamertype is opgenomen in de dataset catsej ('typchamb'). Uit een gesprek met IMA weten we dat het kamertype dat bij opname aangevraagd werd, ingevuld wordt in het gegevensbestand. Als het ziekenhuis een tweepersoonskamer moet toewijzen omdat er bv. geen gemeenschappelijke kamers meer beschikbaar zijn, terwijl de patiënt die aangevraagd heeft, dan wordt dat toch opgenomen in de dataset onder het type 'cc' (meerpersoonskamer). Dit is ook de logische boeking aangezien het ziekenhuis de tarieven moet hanteren van het type kamer dat de patiënt aangevraagd heeft.

Onderstaande frequentietabel voor 2003 leert echter dat in 24% van de observaties het kamertype niet ingevuld of dus onbekend is in de dataset 'catsej'[e]. Met het oog op de samenvoeging van de datasets voor de analyse kennen we aan deze missings een waarde 'o' (i.e. 'onbekend') toe. Op die manier kunnen we een onderscheid maken tussen personen die niet gehospitaliseerd werden versus personen die in onbekend kamertype opgenomen werden.

[e] De observatie-eenheid is per individu, per hospitalisatie en per categorie van uitgaven.

Tabel 11: Verdeling van de ziekenhuisopnames per kamertype (per individu, opname en uitgavencategorie)

typchamb	Frequency	Percent	Cum.Freq.	Cum.Perc.
C1	193,969	17.58	193,969	17.58
C2	201,416	18.25	395,385	35.83
CC	442,550	40.10	837,935	75.93
o	265,672	24.07	1,103,607	100

Bij aggregatie naar 1 observatie per opname worden enkel de gegevens van de laatste dag van opname weerhouden. We weten dus niet wanneer een patiënt voor een bepaalde behandeling van kamer veranderd is. Er zijn 99,260 opnames in 2003 (niet gekoppeld aan de populatiedataset). Bij 40,87% daarvan werd de laatste dag in een onbekend kamertype doorgebracht.

Tabel 12: Verdeling van de ziekenhuisopnames per kamertype (per opname)

typchamb	Frequency	Percent	Cum.Freq.	Cum.Perc.
C1	12,648	12.74	12,648	12.74
C2	13,466	13.57	26,114	26.31
CC	32,581	32.82	58,695	59.13
o	40,565	40.87	99,260	100

Dit percentage reduceert naar 5.33% wanneer enkel gekeken wordt naar klassieke hospitalisaties; bij daghospitalisatie is het kamertype in 95% van de opnames onbekend in 2003.

Tabel 13: Verdeling van de ziekenhuisopnames per kamertype en per soort hospitalisatie (per opname)

Klassieke hospitalisatie				
typchamb	**Freq.**	**Percent**	**Cum.Freq.**	**Cum.Perc.**
c1	11,604	19.37	11,604	19.37
c2	12,562	20.97	24,166	40.33
cc	32,558	54.34	56,724	94.67
o	3,194	5.33	59,918	100
Daghospitalisatie				
typchamb	**Freq.**	**Percent**	**Cum.Freq.**	**Cum.Perc.**
c1	1,044	2.65	1,044	2.65
c2	904	2.3	1,948	4.95
cc	23	0.06	1,971	5.01
o	37,371	94.99	39,342	100

Geneesmiddelen

Met het KB van 29 maart 2002 wordt het voor de publieke officina's en voor ziekenhuisofficina's bij ambulante rechthebbenden verplicht om het persoonlijk aandeel (remgeld) volledig te innen voor vergoedbare farmaceutische specialiteiten, magistrale bereidingen en daarmee gelijkgestelde producten. Hiermee komt in principe een einde aan de toegekende ristorno's ten voordele van de patiënt vanwege de apothekers. Tussen de verzekeringsinstellingen is afgesproken om deze bedragen in de Farmanet-databank te

boeken onder de vorm van supplementen. Deze worden op 0 gezet (i.e. voor categorieën die voorkomen tussen 9-40). Kortingen die de apothekers toekennen worden niet weerspiegeld in de databank.

Voor geneesmiddelen bestaat de eigen bijdrage van de patiënt uit het wettelijk vastgelegde remgeld en uit de bijdragen die patiënten moeten betalen in het kader van de referentieterugbetaling. Dat laatste kan eigenlijk beschouwd worden als een supplement omdat de patiënt zelf kan bepalen of zij al dan niet een generisch geneesmiddel wenst. We kunnen hier echter dit onderscheid niet maken omdat alles onder de remgelden geboekt werd. Dit vormt echter geen groot probleem aangezien deze 'supplementen' wel in de remgeldteller meegeteld worden in het kader van de maximumfactuur. In onze analyses worden deze bedragen dus als remgelden beschouwd.

Een ander probleem is het feit dat er geen enkele informatie is met betrekking tot over-the-counter-consumptie waardoor een onderschatting van de werkelijke kost ontstaat.

Bij een klassieke hospitalisatie en een opname in een chirurgisch dagziekenhuis wordt er voor de geneesmiddelen een forfaitair bedrag aangerekend per verblijfdag, ongeacht het aantal geneesmiddelen dat voorgeschreven werd. Gezien dit geneesmiddelenforfait in een aparte categorie (199) opgenomen is, mag er bij de categorieën voor geneesmiddelen bij hospitalisatie geen remgeld voorkomen. Daarom zetten we alle positieve remgelden die aangerekend werden bij de categorieën van geneesmiddelen voor hospitalisatie (categorieën 181-187, 193-195) op 0. Deze remgelden zijn immers bedragen die louter informatief berekend werden. Ook de hierbij ingevulde supplementen worden op nul gezet. Bij geneesmiddelen van categorie D (categorie 198) vinden we ook remgelden. We zetten die ook om naar supplementen omdat de uitgaven aan geneesmiddelen D volledig ten laste van de patiënt vallen.

Bij al deze omzettingen worden bedragen in het interval]-0.01; 0.01[ook op nul gezet.

Verpleegdagprijs

- Categorie 208 verpleegdagprijs: in principe mogen hier enkel ZIV-terugbetalingen in staan. We zetten remgeld op 0.

Opmerking: deze ZIV-bedragen zijn fout en worden vervangen door nieuwe (zie verder).

- Categorie 215 diverse kosten. We tellen ingevulde remgelden op bij de oorspronkelijk ingevulde supplementen, daarna zetten we remgeld op nul.
- Categorie 250 kamersupplement: analoog.

Opmerking

Vanaf 1 juli 2002 is een nieuwe wet met betrekking tot de ziekenhuisfinanciering in voege getreden. De vroegere verpleegdagprijs weerspiegelde de kostprijs van een ziekenhuisopname. Met de nieuwe ziekenhuisfinanciering worden de verblijfskosten vergoed met het "budget van financiële middelen – BFM". Het BFM wordt door de verzekeringsinstellingen aan de ziekenhuizen betaald voor hun leden. Het BFM bestaat uit een vast en een variabel gedeelte. Het vaste gedeelte, ongeveer 80% van het BFM, wordt betaald in maandelijkse schijven (begrotingstwaalfden) en is niet individueel toewijsbaar. Het variabele gedeelte bestaat uit een bedrag per opname en een bedrag per dag en wordt uitbetaald op basis van de ziekenhuisfacturen.

Bij de oorspronkelijke levering van de gegevens werd geen rekening houden met de modaliteiten van de nieuwe ziekenhuisfinanciering. Daarom kregen we een extra dataset aangeleverd zowel voor 'catagg' als 'catsej' voor 2003 met nieuwe categorieën voor de 'verpleegdagprijs'. Deze nieuwe categorieën stellen ons in staat om de individuele uitgaven en de uitgaven per opname op te hogen tot een meer realistische benadering van de werkelijke kosten. Er was geen nieuwe levering voor 2002. Daarom mag in de analyse het totaal aan ZIV-terugbetalingen niet vergeleken worden tussen 2002 en 2003. De uitgaven

voor 2002 zijn een onderschatting van de ziekenhuiskosten met ongeveer 80% (de begrotingstwaalfden).

In de nieuwe levering werd categorie 208 opgesplitst in verschillende componenten. Categorie 910 (bestaande uit de vroegere boekhoudcodes 761+763+765+790+791+792+767+768+769+708+705) moet niet opgehoogd worden omdat deze categorie geen codes bevat die onder het nieuwe systeem vallen. Categorie 962a (moet op nul gezet worden indien niet nul) en 962b is de oude boekhoudcode 762; categorie 964a en 964b is boekhoudcode 764 en categorie 966a en 966b is boekhoudcode 766. De categorieën 962b, 964b en 966b moeten opgehoogd worden met factor 10 bij de berekening van de correcte verpleegdagprijs.

Ook bij de opnames in een chirurgisch dagziekenhuis (opgenomen in categorie 124) moeten aanpassingen gebeuren. Dit is ingevoerd met de nieuwe wet op de ziekenhuisfinanciering. Normaliter is dit een daghospitalisatie en dus ambulant. Onder bepaalde omstandigheden kan dit echter ook als een klassieke hospitalisatie beschouwd worden. Wij nemen de categorie 124 daarom op bij de hospitalisatiecodes. Op basis van de nieuwe regeling van ZIV-terugbetalingen berekenen we de nieuwe categorie 124 als volgt: oude categorie 124-(cat 910+cat 962a+cat 962b+cat 964a+cat 964b+cat 966a+cat 966b-cat 208). Hierbij gaan we de categorieën 962b, 964b en 966b niet vermenigvuldigen met 10.

Voor de remgelden en de supplementen blijven we de 'oude categorieën' gebruiken omdat deze in principe correct moeten zijn. Bovendien werd in de nieuwe categorieën niet gespecificeerd welke meetellen voor de remgelden in de MaF en welke niet.

Andere aanpassingen

Remgeld opgeteld bij supplementen en daarna remgeld op nul gezet voor volgende categorieën:

- Categorie 162: reiskosten van kankerlijders (alleen terugbetaling)
- Categorie 163: reiskosten van prematuren (alleen terugbetaling)
- Categorie 204: implantaten buiten nomenclatuur
- Categorie 210: paramedisch materiaal

Remgelden op 0 voor volgende categorieën:

- Categorie 89: invalidenwagentjes en toestellen voor hulp bij het lopen
- Categorie 90: banden, gordels, borstprothesen en materieel voor mucoviscidosis
- Categorie 91: lumbostaat in tijk en metaal bandagisten-orthopedisten
- Categorie 93: urinaal, kunstaars en traceacanule
- Categorie 167: oftalmologie
- Categorieën 234-239: MaF variabelen

Supplementen op 0 voor volgende categorie:

- Categorie 123: forfaitaire honoraria voor de ambulante verstrekkingen van klinische biologie (remgeld)

Remgelden en supplementen op 0 voor volgende categorie:

- Categorie 49: bijkomend honorarium voor het beheer van het globaal medisch dossier (GMD) ter gelegenheid van een raadpleging in de spreekkamer en administratieve verlenging GMD

Aggregatie van de categorieën

Omdat veel categorieën slechts een klein aantal observaties bevatten, is het noodzakelijk verder te aggregeren. We weten van elke categorie of ze wijst op ambulante zorg of zorg naar aanleiding van hospitalisatie. Daardoor kunnen we 2 grote subgroepen creëren: ambulante uitgaven en uitgaven met betrekking tot een hospitalisatie.

Anderzijds maken we ook een aantal kleinere subgroepen die we gaan gebruiken voor meer gedetailleerde analyses.

Binnen de ambulante sector beschouwen we de volgende subgroepen:

- geneesmiddelen
- huisarts
- specialisten
- geneesheer-specialisten
- heelkunde
- paramedische beroepen (verpleegkunde, vroedvrouwen, bandagisten, orthopedie, opticien, audicien, logopedie)
- kinesitherapie
- tandverzorging
- klinische biologie
- rest (forfait spoed, honoraria dialyse, medische beeldvorming, zorgforfait, revalidatie en herscholing, palliatieve zorgen, rust- en verzorgingstehuizen, rustoorden voor bejaarden, dagcentra, psychiatrische verzorgingstehuizen en medisch pediatrische centra)

Voor de hospitalisatiecodes maken we volgende subgroepen:

- medische honoraria
- heelkunde
- kinesitherapie
- gynaecologie
- medische beeldvorming
- geneesmiddelen
- implantaten artikel 28
- implantaten artikel 35
- implantaten artikel 35bis
- implantaten buiten nomenclatuur
- implantaten afleveringsmarge
- paramedisch materiaal
- klinische biologie
- verpleegdagprijs exclusief diverse kosten
- diverse kosten

- rest

De gedetailleerde omschrijving van de samenstelling van de subgroepen is terug te vinden in onderstaande tabel 14.

Tabel 14: Samenstelling van de subcategorieën van uitgaven

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Geneesmiddelen			DRUGS_A
Radio-isotopen	204	1	
Vol bloed en labiele bloedproducten	205	1	
Moedermelk	208	1	
Gipsbanden en ander gipsmateriaal	240	1	
Wachthonorarium	209	0	
Parenterale voeding ten huize	211	0	
Insulinespuiten	212	0	
Enterale voeding die ten huize van de patiënt via sonde wordt toegediend	213	1	
Chronisch zieken - producten voor bijzondere voeding	214	0	
Tegemoetkoming in de kosten van de autosondage bij de patiënt thuis	215	0	
Mucoviscidosis	216	0	
Tegemoetkoming voor haarprothesen	217	0	
Specialiteiten afgeleverd aan niet-gehosp rechthebbenden in de officina's			
categorie A	221	1	
categorie B	222	1	
categorie C	223	1	
categorie Cs	224	0	
categorie Cx	225	0	
Magistrale bereidingen, afgeleverd aa n niet-gehospitaliseerde rechthebbenden, in de ziekenhuisofficina's	270:273	0	
Magistrale bereidingen, afgeleverd aan niet-gehospitaliseerde rechthebbenden, in de publieke officina's	274:277	0	
Dieetvoeding voor medisch gebruik afgeleverd aan niet-gehospitaliseerde rechthebbenden in de officina's	(281)		
categorie A	755510	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
categorie B	755532	1	
categorie C	755554	1	
categorie Cs	755576	0	
categorie Cx	755591	0	
Dieetvoeding voor medisch gebruik afgeleverd aan niet-gehospitaliseerde rechthebbenden in de zkhofficina's	(283)		
categorie A	755613	1	
categorie B	755635	1	
categorie C	755650	1	
categorie Cs	755672	0	
categorie Cx	755694	0	
Diagnostische middelen en verzorgingsmiddelen afgeleverd aan niet-gehospitaliseerde rechthebbenden in de officina's	(284)		
categorie A	755716	1	
categorie B	755731	1	
categorie C	755753	1	
categorie Cs	755775	0	
categorie Cx	755790	0	
Diagnostische middelen en verzorgingsmiddelen afgeleverd aan niet-gehospitaliseerde rechthebbenden in de ziekenhofficina's	(286)		
categorie A	755812	1	
categorie B	755834	1	
categorie C	755856	1	
categorie Cs	755871	0	
categorie Cx	755893	0	
Specialiteiten, afkomstig van de ziekenhuisofficina, en afgeleverd aan niet ter verpleging opgenomen rechthebbenden			
categorie A	251	1	
categorie B	252	1	
categorie C	253	1	
categorie Cs	254	0	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
categorie Cx	255	0	
pers aandeel enterale voeding via sonde of stomie	297	1	
referentieterugbetaling	*753911, 753933, 753955, 753970,753992, 754854, 754832 (à retirer du 251-255)*		
Huisartsen			GP_A
Adviezen	100	1	
Raadplegingen	101	1	
Bezoeken	102	1	
bezoeken tegen verhoogd tarief	103; 103213, 103235, 103316, 103331, 103353, 103412, 103434, 103515, 103530, 103552	1	
	103913, 103935, 103950, 104112, 104134, 104156, 104215, 104230, 104252, 104274, 104355	1	
	104392, 104414, 104436, 104451, 104510, 104532, 104554, 104576, 104650, 104694	1	
	104716, 104731, 104753	1	
reiskosten van de geneesheren	106; qual < 010	1	
Vast bedrag geneeskunde in gezondheidscentra	112	0	
Bijkomend honorarium voor	113;	1	
dringende raadplegingen	102410, 102432, 102454, 102476,	1	
en bezoeken	104296, 104311, 104333, 104591, 104613, 104635	1	
Bezoek aan een in een ziekenhuis opgenomen rechthebbende	140	1	
Geneeskundige bijstand gedurende zijn dringende overbrenging, per ziekenwagen, naar een ziekenhuis	141	1	
Bijkomend honorarium voor het beheer van het globaal medisch dossier ter gelegenheid van een raadpleging in de spreekkamer	150		
administratieve verlenging GMD	151	0	
Diabetespas	853	1	
a) Gewone verstrekkingen			
Technische geneeskundige verstrekkingen : généraliste	105; qual < 010	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Dringende technische verstrekkingen: généraliste	490; qual < 010	1	
Geneesheer-specialisten			PHYSSPEC_A
Raadplegingen van een geneesheer-specialist	104	1	
Specialisten			SPECIAL_A
bezoeken tegen verhoogd tarief	103; 103014, 103051, 103073, 103751, 103773, 103795, 103810, 103832, 104812, 104834	1	
	104856, 104871	1	
Bijkomend honorarium voor	(113)	1	
dringende raadplegingen en bezoeken	102491, 102513, 103854, 103876, 103891	1	
Raadplegingen van een specialist voor inwendige geneeskunde	107	1	
Raadplegingen van een neuroloog, van een psychiater of van een neuropsychiater	108	1	
Raadplegingen van een kinderarts	109	1	
Bezoeken van een kinderarts bij de zieke thuis	111	1	
Raadplegingen van een cardioloog	110	1	
Psychotherapieën	142	1	
Dringende technische verstrekkingen : spécialiste	490; qual >= 010	1	
verstrekkingen : spécialiste	105; qual >= 010	1	
Algemene speciale verstrekkingen	413 behalve 350055; 350512; 350571; 350593; 351035; 353253; 355390:355434; 355471:355515 , 355596; 355913	1	
Puncties	414	1	
Stomatologie :	417:419	1	
Percutane interventionele verstrekkingen onder medische beeldvorming	442	1	
Radiotherapie en radiumtherapie	445	1	
1) Behandeling met radioactieve isotopen, vloeibare vorm	446	1	
2) Tests of doseringen :a)in vivo	447 behalve 442212; 442234; 442411;	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Inwendige geneeskunde :	442455; 442492; 442610; 442632; 442816; 442831; 442853; 442971		
Inwendige geneeskunde	450 behalve 470050;	1	
Inwendige geneeskunde : Pneumologie	451 behalve 471015; 471030; 471052; 471251; 471273; 471295; 471310; 471332; 471354, 471376; 471391; 471413; 471516; 471575; 471715; 471730; 471752; 471811; 471472	1	
Inwendige geneeskunde: Gastro-enterologie	452 behalve 471811; 472076; 472113; 472135; 472216; 472231; 472253; 472356; 472415; 472452; 472511; 473012, 473034:473056; 473093; 473130; 473174; 473233; 473255; 473351; 473491; 473594; 473616, 473631; 472194	1	
Kindergeneeskunde	454 behalve 474095; 474110; 474132; 474154; 474176; 474191; 474235; 474250; 474272; 473353; 474493, 474530; 474524; 474596	1	
Cardiologie	455 behalve 475075; 475090; 475532; 475650; 475753; 475812; 1475834; 475856; 475871; 475893, 476011; 476033; 476055; 476070; 476276; 476291; 476313; 476114; 476136; 476173; 476195; 476210; 476232; 476254; 476615; 476630	1	
Neuropsychiatrie	456 behalve 477116; 477131; 477190; 477234; 477315; 477330; 477352; 477374; 477411; 477433; 477470, 477492; 477514; 477536	1	
Elektrocardiografische onderzoekingen, met protocol	457	1	
Dermato-venereologie	459 behalve 532011; 532114; 532534; 532571;	1	
Pathologische anatomie (art. 32 = artikel 37 bis)	468	1	
Genetische onderzoeken (artikel 33 =artikel 37 bis)	469	1	
Fysiotherapie	470 behalve 558350; 558552; 558574; 558596; 558611; 558633; 558655; 558935	1	
reiskosten van de geneesheren	106; qual > 010	1	
artikel 37bis			
Algemene speciale verstrekkingen artikel 37 bis	350055; 350512; 350571; 350593; 351035; 353253; 355390:355434;	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
	355471:355515, 355596; 355913		
2) Tests of doseringen :a)in vivo	442212; 442234; 442411; 442455; 442492; 442610; 442632; 442816; 442831; 442853; 442971		
Inwendige geneeskunde artikel 37bis	470050	1	
Pneumologie artikel 37bis	471015; 471030; 471052; 471251; 471273; 471295; 471310; 471332; 471354	1	
	471376; 471391; 471413; 471472; 471516; 471575; 471715; 471730; 471752; 471811	1	
Gastro-enterologie artikel 37 bis	471811; 472076; 472113; 472135; 472194; 472216; 472231; 472253; 472356; 472415; 472452; 472511; 473012	1	
	473034:473056; 473093; 473130; 473174; 473233; 473255; 473351; 473491; 473594; 473616	1	
	473631;	1	
Kindergeneeskunde artikel 37 bis	474095; 474110; 474132; 474154; 474176; 474191; 474235; 474250; 474272; 473353; 474493	1	
	474530; 4745524; 474596	1	
Cardiologie artikel 37 bis	475075; 475090; 475532; 475650; 475753; 475812; 475834; 475856; 475871; 475893	1	
	476011; 476033; 476055; 476070; 476276; 476291; 476313; 476114; 476136; 476173; 476195;	1	
	476210; 476232; 476254; 476615; 476630	1	
Neuropsychiatrie artikel 37 bis	477116; 477131; 477190; 477234; 477315; 477330; 477352; 477374; 477411; 477433; 477470	1	
	477492; 477514; 477536	1	
Dermato-venereologie artikel 37 bis	532011; 532114; 532534; 532571;	1	
Fysiotherapie artikel 37bis	558350; 558552; 558574; 558596; 558611; 558633; 558655; 558935	1	
Oftalmologie	561:563 behalve 248511:248916; 248953; 248975	1	
gynaecologie			

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
a) Algemeen geneeskundige	640	1	
b) Assistentie	641	1	
c) Geneesheer-specialist	642	1	
d) Verloskundige verstrekkingen	643	1	
Operatieve hulp	652	1	
Gynaecologie-verloskunde :	661:663	1	
e) Accreditering	645	0	
Heelkunde			SURGERY_A
Algemene heelkunde	502; 503 behalve 220091; 220290	1	
Neurochirurgie	511:513 behalve 230333	1	
Plastische heelkunde	521:523	1	
Heelkunde op het abdomen	531:533 behalve 243633	1	
Heelkunde op de thorax	541:543 behalve 227091; 227452; 228152	1	
Heelkunde op de bloedvaten	551:553	1	
Otorhinolaryngologie	571:573 behalve 254995:255076; 255113; 255135; 256594; 257294; 257316; 257596:257670	1	
	257692; 257714; 257736; 257773; 257795; 257913; 257935; 258296; 258510; 258613	1	
	258812; 258834	1	
Urologie	581:583 behalve 260271; 260293; 260330; 261531; 261914; 261936; 261951; 261973; 261995; 262356; 262371	1	
Orthopedie	596; 597 behalve 280173; 280195; 280210; 280770; 300252; 300274	1	
Anesthesiologie	514	1	
assistentie bij anesthesiologie	515		
Operatieve hulp -	516	1	
Reanimatie	517 behalve 214211	1	
Transplantaties	518	1	
weefsels van menselijke oorsprong	519	1	
artikel 37 bis			
Reanimatie artikel 37 bis	214211	1	
Algemene heelkunde :artikel 37 bis	220091; 220290;	1	
Neurochirurgie artikel 37 bis	230333	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Heelkunde op het abdomen artikel 37bis	243633	1	
Heelkunde op de thorax artikel 37 bis	227091; 227452; 228152	1	
Otorhinolaryngologie artikel 37 bis	254995:255076; 255113; 255135; 256594; 257294; 257316; 257596:257670	1	
	257692; 257714; 257736; 257773; 257795; 257913; 257935; 258296; 258510; 258613	1	
	258812; 258834	1	
Urologie artikel 37bis	260271; 260293; 260330; 261531; 261914; 261936; 261951; 261973; 261995; 262356; 262371	1	
Orthopedie artikel 37bis	280173; 280195; 280210; 280770; 300252; 300274	1	
Oftalmologie artikel 37 bis	248511:248916; 248953; 248975	1	
Paramedische honoraria			PARAMEDICAL_A
verpleegkundigen			*nursing_a*
forfaitaire honoraria A	425670; 425272	1	
forfaitaire honoraria B	425294; 425692	1	
forfaitaire honoraria C	425316; 425714	1	
forfaitaire honoraria palliatief (PC-PP-PA-PN-PP)	427011; 427033; 427055; 427173; 427092; 427114; 427136; 427195; 427151; 427070	1	
forfaitaire honoraria diabetspatiënten	423135; 423150; 423172; 423194; 423216; 423231; 423334	1	
Toiletten	425110, 425515, 425913	1	
Individuele verstrekkingen	116 behalve 425272; 425294; 425316; 425110; 425913; 427011; 427033; 427055; 427173; 427092; 427114; 427136	1	
	427195; 427151; 427070	1	
Reiskosten	119		
GDT's	920		
Verstrekkingen tegen verhoogd tarief	118 behalve 425670; 425692; 425714; 425515	1	
Vast bedrag verpleegkunde in gezondheidscentra	120	1	
vroedvrouwen			*midwife_a*
Verlossingen door vroedvrouwen :			

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
a) Inspuitingen	628	1	
b) Reiskosten (prenatale verzorging - risicozwangerschap)	635	1	
c) Prenatale zorgen	636	1	
d) Toezicht en hulp aan de parturiente tijdens de arbeidsfase	637	1	
f) Postnatale zorgen	639	1	
e) Verlossingen	638	1	
bandagisten			*bandager_a*
1) Invalidenwagentjes en toestellen voor hulp bij het lopen	317	1	
2) Banden, gordels, borstprothesen en materieel voor mucoviscidosis	360	1	
3) Lumbostaat in tijk en metaal bandagisten	361		
1) Lumbostaat in tijk en metaal orthopedisten	365	1	
5) Urinaal, kunstaars en traceacanule	363	1	
orthopedisten			*orthoped_a*
3) Verstrekkingen opgenomen onder MAATWERK	367	1	
4) Verstrekkingen opgenomen onder PREFAB	368	1	
5) Verstrekkingen opgenomen onder I.M.F.	369	1	
6) Drukkledij en maskers voor zwaar verbranden	370	1	
7) Orthopedische schoenen	371	1	
8) Myo-elektrische prothesen	372	1	
4) Orthopedische zolen bandagisten	362		*sole_a*
2) Orthopedische zolen orthopedisten	366	1	
opticiens			*optician_a*
Verzorging door opticiens	373	1	
audiciens			*audiol_a*
Verzorging door audiciens	375	1	
logopedisten en orthopt			*logo_ortho_a*
B. Individuele revalidatie: Logopedische behandeling	850	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
B. Individuele revalidatie : Orthoptische behandeling	851	1	
Kinesitherapeuten			PHYSIOTH_A
kinesitherapeuten	305	1	
Vast bedrag kinesitherapie in gezondheidscentra	306	0	
Verzorging tandheelkundigen			DENTAL_A
Raadplegingen in de spreekkamer van een licentiaat in de tandheelkunde of van een tandarts die houder is van een bekwaamheidsgetuigschrift en bijkomend honorarium, voor een dringende raadpleging in de spreekkamer van een tandheelkundige	121	1	
Raadpleging van een licentiaat in de tandheelkunde of van een tandarts die houder is van een bekwaamheidsgetuigschrift, door een geneesheer aangevraagd, bij de zieke thuis	122	1	
Heelkundige extractie van een tand met resectie van omliggend bot en hechten van de ingesneden slijmvlieslappen	124	1	
Bewaarshalve verleende tandverzorging	125	1	
Tandprothesen	126	1	
Preventieve verzorging	127	1	
Radiografieën	128	1	
Orthodontische behandelingen :			
a) Onderzoeken vóór een eventuele orthodontische behandeling, inclusief de raadpleging, die het nemen van een afdruk van de twee bogen, het vervaardigen van de afgietsels, het stellen van de diagnose en het behandelingsplan omvatten, met verslag	131	1	
b) Vaste maandbedragen voor regelmatige behandeling	132	1	
c) Vaste bedragen voor toestellen	133	1	
d) Orthodontische adviezen of orthodontische onderzoeken, met verslag	134	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
e) Trimestriële zitting voor contentie controle	135	1	
f) Vervaardigen, op verzoek van de Technische Tandheelkundige Raad, van de afgietsels van de afdruk van twee bogen, genomen naar aanleiding van een aanvraag om verdere orthodontische behandeling	136	1	
Tandverzorging kinderen in kansarmoede	198	0	
Klinische biologie			CLINICAL_A
Technische geneeskundige verstrekkingen			
b) Klinische biologie : généraliste	120013 à 124515	1	
b) Klinische biologie : spécialiste	115 : sauf les code généraliste	1	
Nucleaire geneeskunde :			
2) Tests of doseringen :b)in vitro	448	1	
Klinische biologie	465	1	
Forfaitaire honoraria voor de ambulante verstrekkingen van klinische biologie (geen remgeld)	(463) 592815; 592830; 592933; 593036; 593132; 592852; 592874; 592970; 593073; 593176	1	
Klinische biologie en forfaitair honorarium per verpleegdag	467	1	
Forfaitaire honoraria voor de ambulante verstrekkingen van klinische biologie (remgeld)	(463) 592911; 593014; 593110; 592955; 593051; 593154	1	
Rest ambulant			OTHER_A
forfait spoed	960256	1	
Honoraria nierdialyse en honoraria nierdialyse kindergeneeskunde	453	1	
Hemodialyse thuis	740	1	
Dialyse in een collectief autodialysecentrum	741	1	
Peritoneale dialyse thuis	742	1	
Reiskosten dialyse	743	0	
Forfaitaire verpleegdag nierdialyse	744	1	
Echografie	437	1	
Echografie	441	1	
Radiologie : Screeningsmammografie	438	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Radiologie	439	1	
Radiologie	440	1	
Forfait chronisch zieke	910	0	
Forfait incontinentiemateriaal	911	0	
Forfait voor nakuur bij revalidatie	726	1	
A. Overeenkomsten :			
Refractaire epilepsie	805	1	
Dagcentra voor palliatieve verzorging	812	1	
Centra ongewenste zwangerschap	813	1	
Chronisch vermoeidheidssyndroom	814	1	
Algemene centra	840	1	
Revalidatie voor gehoor- en spraakgestoorden	843	1	
Revalidatie psychisch gehandicapten	846	1	
Revalidatie voor psychisch minder-validen: categorie V	847	1	
Revalidatie wegens visuele handicap	849	1	
B. Individuele revalidatie: Omscholing	820	1	
A. Overeenkomsten: Omscholing	870	1	
B. Individuele revalidatie :			
Bijzonder solidariteitsfonds	830	1	
Orthoptische behandeling	852	1	
Revalidatie van hartpatiënten	853	1	
Toerusting (art. 151 + nomenclatuur)	855	1	
MYO-ELEK. PROTH., INCL. GED. GETARIF. NOMENCL.	860	1	
D. Reiskosten	859	1	
A. Overeenkomsten :			
Palliatieve verzorging	868	1	
Chronische mechanische ademhalingsondersteuning thuis	869	1	
Zuurstoftherapie thuis	881	1	
Ernstige chronische ademhalingsstoornissen	897	1	
Motorische revalidatie	871	1	
Psychosociale revalidatie	872	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Revalidatieprogramma voor psychotici	874	1	
Revalidatieprogramma voor alcoholici en druggebruikers	873	1	
Revalidatieprogramma voor rechthebbenden met ernstige aanpassingsstoornissen - Mishandelde kinderen	875	1	
Revalidatieprogramma voor epileptici - (Mucoviscoïdosis) - Medico-psycho-sociaal	876 behalve 772413	1	
Mucoviscidose	895; 876 (enkel 772413)	1	
Revalidatieprogramma voor rechthebbenden met neurolinguistische stoornissen	877	1	
Revalidatieprogramma voor slechthorenden	879	1	
Revalidatieprogramma voor visueel gehandicapten	880	1	
Respiratorisch en cardio-respiratorisch toezicht thuis op door wiegedood bedreigde zuigelingen	883	1	
Revalidatieprogramma voor hersenverlamden	884	1	
Zelfcontrole diabetespatiënten-Insuline infusietherapie – Diabetes mellitus	886	1	
Kankerpatienten	888	1	
Metabole ziekte	889	1	
Overschrijding "normale facturatiecapaciteit"	890	1	
E. Herfacturatie revalidatie	894	1	
Neuromusculaire ziekten	896	1	
Reiskosten van kankerlijders = ! Alleen terugbetaling	992	0	
Reiskosten van prematuren = ! Alleen terugbetaling	993	0	
Rust- en verzorgingstehuizen	(750)		
forfait B5	764094; 764632; 764750	0	
RVT Kat C	764116; 764654; 764676; 764772	0	
RVT Kat CD	764131; 764794; 764691; 764713	0	
RVT forfait B4	764190; 764610; 764735	0	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
RVT Palliaitieve/ RVT forfait arts	756	0	
Rustoorden voor bejaarden - Geregistreerde niet-erkende inrichtingen	(753)		
KAT 0	764315	0	
KAT A	764330	0	
KAT B	764352	0	
KAT C	764396	0	
ROB (niet erkend)	764411	0	
ROB KAT C	764433	0	
ROB palliatief	757	0	
Tegemoetkoming in de centra voor dagverzorging	755	0	
Psychiatrische verzorgingstehuizen	752 behalve 791615:791873	0	
Initiatieven van beschut wonen	754	0	
Psychiatrische verzorgingstehuizen	791615:791873	1	
Medisch pediatrische centra			
Ambulante en interne tenlastenemingsdag	901	1	
Ambulante en interne tenlastenemingsdag - overschrijding normale facturatie	905	1	
Ambulante en interne tenlastenemingsdag	773021; 773463	0	
Ambulante en interne tenlastenemingsdag - overschrijding normale facturatie	773500	0	
Herfacturatie medisch pediatrische centra	904	0	
Forfait palliatieve thuispatienten	912	0	
Medische honoraria			MEDICAL FEE_H
Speciale verstrekkingen	105; 413 ; 414; 417:419; 442; 445:447; 450:452; 454:457, 459; 468:470; 490;	1	
Persoonlijk aandeel speciale medische technische prestaties	495	1	
Oftalmologie	561:563	1	
Honorarium voor medische wachtdienst in het ziekenhuis	718	1	
Toezicht op de in een ziekenhuis	719	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
opgenomen rechthebbenden			
Forfaitair honorarium dat per verpleegdag wordt betaald voor de verstrekkingen inzake klinische biologie van de in een ziekenhuis opgenomen rechthebbenden	464	1	
Heelkunde	502; 503; 511:519; 521:523; 531:533; 541:543; 551:553, 571:573; 581:583; 596; 597	1	SURGICAL FEE_H
Verzorging door kinesitherapeuten	305	1	PHYSIO FEE_H
Gynaecologie			GYNAEC FEE_H
Verlossingen door geneesheren :			
a) Algemeen geneeskundige	640	1	
b) Assistentie	641	1	
c) Geneesheer-specialist	642	1	
d) Verloskundige verstrekkingen	643	1	
Operatieve hulp	652	1	
Gynaecologie-verloskunde :			
K 400 en meer	661	1	
K 76 tot K 399	662	1	
K 75 en minder	663	1	
e) Accreditering	645	0	
Medische beeldvorming			RADIO FEE_H
Radiologie : Screeningsmammografie	438	1	
Radiologie	439	1	
Radiologie	440 behalve 460784	1	
Echografie	441	1	
Echografie	437	1	
Forfait radiologie per opname	460784	1	
Klinische biologie: omschrijving, zie hierboven	115; 448; 465; 467	1	CLINICAL FEE_H
Geneesmiddelen			DRUGS_H
(omschrijving: zie ambulant)	204; 205; 208; 240;	1	
(omschrijving: zie ambulant)	217	0	
Desinfecterende baden bij brandwonden	210	0	
Specialiteiten afgeleverd aan			

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
gehospitaliseerde rechthebbenden			
categorie A	231	enkel ten laste van ziv (gmforfait in maf)	
Categorie B inclusief AB, uitgezonderd forf AB	232	enkel ten laste van ziv (gmforfait in maf)	
Categorie B : AB peri op met forfait vergoeding	236	enkel ten laste van ziv (gmforfait in maf)	
Profylaxis forfait AB	237	enkel ten laste van ziv (gmforfait in maf)	
Categorie C	233	enkel ten laste van ziv (gmforfait in maf)	
Categorie Cs	234	enkel ten laste van ziv (gmforfait in maf)	
Categorie Cx	235	enkel ten laste van ziv (gmforfait in maf)	
Dieetvoeding voor medisch gebruik afkomstig van de ziekenhuisofficina's en afgeleverd aan gehospitaliseerde rechthebbenden	(282)		
categorie A	755521	enkel ten laste van ziv (gmforfait in maf)	
categorie B	755543	enkel ten laste van ziv (gmforfait in maf)	
categorie C	755565	enkel ten laste van ziv (gmforfait in maf)	
categorie Cs	755580	enkel ten laste van ziv (gmforfait in maf)	
categorie Cx	755602	enkel ten laste van ziv (gmforfait in maf)	
Diagnostische middelen en verzorgingsmiddelen afkomstig van de ziekenhuisofficina's en afgeleverd aan gehospitaliseerde rechthebbenden	(285)		
categorie A	755720	enkel ten laste van ziv (gmforfait in maf)	
categorie B	755742	enkel ten laste van ziv (gmforfait in maf)	
categorie C	755764	enkel ten laste van ziv (gmforfait in maf)	
categorie Cs	755786	enkel ten laste van ziv (gmforfait in maf)	
categorie Cx	755801	enkel ten laste van ziv (gmforfait in maf)	
Categorie D	750820	0	
Geneesmiddelenforfait	750002	1	
Artikel 28			IMPL28_H
Implantaten : a) Orthopedie, traumatologie en oftalmologie	310	0	
Implantaten : b) Allerhande apparaten			
1) Shunt voor hemodialyse	311	0	
2) Blaassfincter	312	0	
4) Ent, vilt en weefsel voor angioplastiek	314	0	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
5) Gynaecologie en heelkunde op de borsten	315	0	
6) Andere apparaten	316	0	
artikel 35 Implantaten			IMPL35_H
a) Orthopedie en traumatologie	320		
b) Oftalmologie	682754:682780		
c) Neurochirurgie	322		
d) Otorhinolaryngologie	323 behalve 694072:694105		
e) Urologie en nefrologie	324		
g) Heelkunde op de thorax en cardiologie	684530; 684541; 685731:685801; 684736; 684740; 684655; 684666; 684714; 684725; 687050:687186		
h) Bloedvatenheelkunde	327 behalve 688074:688240; 694562; 694551	1	
Artikel 35 bis Implantaten			IMPL35BIS_H
f) Heelkunde op het abdomen en pathologie van het spijsverteringsstelsel	325		
i) Gynaecologie, plastische en reconstructieve heelkunde	328		
b) Oftalmologie	321 behalve 682754:682780		
d) Otorhinolaryngologie	694072:694015		
g) Heelkunde op de thorax en cardiologie	326 behalve 684530; 684541; 685731:685801; 684736; 684740; 684655; 684666; 684714; 684725; 687050:687186		
h) Bloedvatenheelkunde	688074:688240; 694562; 694551	1	
Rest imlantaten			IMPNON-REIMB_H
andere implantaten buiten nomenclatuur	960234-960245	0	
afleveringsmarge	specifieke code	0	DELIVERY IMPL_H
Verpleegdagprijzen			NURSING DAY_H
Vast bedrag voor verpleegdag: Gipskamer, miniforfait, maxiforfait en superforfait	709	0	
Experiment dagziekenhuisfunctie (forfait A-D)	716	0	
Chirurgisch dagziekenhuis, bedrag per opneming	763		
Chirurgisch dagziekenhuis, bedrag per	764		

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
dag			
Subsidies	790		
Psychiatrisch dagziekenhuis A-dienst	707		
Ziekenhuisverpleging persoonlijk aandeel zowel algemeen ziekenhuis als psychiatrisch ziekenhuis	766021; 766043; 766065; 766080; 766102; 766124; 766220; 766242; 766264; 766286; 766301; 766323; 799422; 799444; 799466; 799481; 799503; 799525; 799540; 799562; 799584; 799606; 799621; 799643; 799665; 799680; 799702; 799724	1	
Ziekenhuisverpleging persoonlijk aandeel zowel algemeen ziekenhuis als psychiatrisch ziekenhuis	799820; 799842; 799746; 799761; 799886; 799783; 799805; 799923; 766426; 766441; 766382; 766404; 766485; 766566; 766581; 766522; 766780; 799820; 799842; 799746; 799761; 799886; 799783; 799805; 799923; 766426; 766441; 766382; 766404; 766485; 766566; 766581; 766522	0	
Verpleegdagprijs	zonder variabele 206 en 207		
Niet-universitaire inrichtingen	700	0	
Verlossingen niet-universitaire inrichtingen	702	0	
Heelk. Obser./ behand. gemengde inrichtingen	704	0	
verblijf in dienst "n"	705	0	
Verlossingen gemengde inrichtingen	706	0	
ziekenhuisverpleging in het buitenland	708	0	
heelk. obser./ behand. universitaire inrichtingen	710	0	
brandwonden	711	0	
Verlossingen universitaire inrichtingen	712	0	
all-in prijs milit ziekenhuis brandwonden	713	0	
psychiatrische inrichtingen	714	0	
dagprijs verzorging in diensten	715	0	
- Acute ziekenhuizen: Bedrag per opneming	761	0	
- Centra voor brandwonden: Bedrag per dag	762	0	
- Chirurgisch dagziekenhuis: Bedrag per opneming	763	0	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
- Chirurgisch dagziekenhuis: Bedrag per dag	764	0	
- Sp-diensten andere dan palliatieve: Bedrag per opneming	765	0	
- Sp-diensten andere dan palliatieve: Bedrag per dag	766	0	
- Psychiatrische ziekenhuizen (erkenningsnummer 7.20.***.**): Bedrag per dag	767	0	
- Palliatieve Sp-diensten: Bedrag per dag	768	0	
- Centra voor brandwonden: Bedrag per dag	769	0	
Subsidies	790	0	
Verblijven in collectieve vakantiekampen	791		
Gezinsverpleging in een gezin - dienst Tp	792	0	
forf dagprijzen in ziekenhuizen			
Vast bedrag voor verpleegdag: Gipskamer, miniforfait, maxiforfait en superforfait	709	0	
Experiment dagziekenhuisfunctie	716	0	
niet-implanteerbaar gebruiksmateriaal	717	0	
vaste bedragen in ziekenhuizen	727	0	
Suppléments de chambre	761611, 761622, 761633, 761644	0	
Diverse kosten	960XXX behalve implantaten en spoedforfait	0	DIVCOST_H
Paramedisch materiaal			PARAMEDICAL_H
farmaceutisch en parafarmaceutische producten	960116; 960120	0	
tandverzorging			REST_HOSP
Heelkundige extractie van een tand met resectie van omliggend bot en hechten van de ingesneden slijmvlieslappen	124	1	
Bewaarshalve verleende tandverzorging	125	1	
Tandprothesen	126	1	
Preventieve verzorging	127	1	
Radiografieën	128	1	

Omschrijving documenten C	Boekhoudcodes / nomenclatuurcodes / pseudocodes	0=niet Maf 1=Maf	Definitie Subgroepen
Orthodontische behandelingen :			
a) Onderzoeken vóór een eventuele orthodontische behandeling, inclusief de raadpleging, die het nemen van een afdruk van de twee bogen, het vervaardigen van de afgietsels, het stellen van de diagnose en het behandelingsplan omvatten, met verslag	131	1	
b) Vaste maandbedragen voor regelmatige behandeling	132	1	
c) Vaste bedragen voor toestellen	133	1	
d) Orthodontische adviezen of orthodontische onderzoeken, met verslag	134	1	
e) Trimestriële zitting voor contentiecontrole	135	1	
f) Vervaardigen, op verzoek van de Technische Tandheelkundige Raad, van de afgietsels van de afdruk van twee bogen, genomen naar aanleiding van een aanvraag om verdere orthodontische behandeling	136	1	
Verlossingen door vroedvrouwen :			
e) Verlossingen	638	1	
Verzorging door bandagisten :			
1) Invalidenwagentjes en toestellen voor hulp bij het lopen	317	1	
Logopedie	850	1	
Verzorging door bandagisten :			
5) Urinaal, kunstaars en traceacanule	363	1	
Implantaten: Implanteerbare hartdefibrillatoren	318	1	
Honoraria nierdialyse (miv kindergeneeskunde)	453	1	
Forfaitaire verpleegdag nierdialyse	744	1	

Als na de optelling van de verschillende categorieën binnen een subgroep nog negatieve bedragen staan, worden deze op nul gezet. Negatieve bedragen kunnen voorkomen in bepaalde gevallen: dit gaat over regularisaties. Het is echter praktisch ondenkbaar om zich een situatie in te beelden waarvoor op jaarbasis nog negatieve bedragen kunnen voorkomen bij aggregatie van de aparte categorieën tot de door ons gedefinieerde subgroepen.

Dataset met ziekenhuisgegevens

Om op een meer gedetailleerde manier de omschrijving (bv. verband tussen ziekenhuiskenmerken en gevraagde supplementen) te kunnen uitvoeren voor de supplementen in het kader van een hospitalisatie, hebben we een bijkomende dataset met ziekenhuisgegevens ontvangen van de FOD Volksgezondheid, Veiligheid van de voedselketen en leefmilieu (Centraal Instellingenbestand). Volgende variabelen zijn opgenomen:

- Type ziekenhuis: acuut, chronisch of psychiatrisch
- Statuut ziekenhuis: publiek (bv. OCMW) versus privé
- Aantal erkende bedden: minder dan 250, 250-500 en meer dan 500
- Arrondissement van het ziekenhuis. Dit aggregeren we tot de provincie.

Finale dataset

Om tot de finale dataset te komen, moeten we de uitgavengegevens en de populatiekarakteristieken aan elkaar koppelen. We beschrijven hier de verschillende stappen van deze koppeling.

Recuperatie gegevens

We vertrekken vanuit de populatiedatasets voor 2003. Gedetailleerd onderzoek en contacten met mensen van het IMA leren dat die gegevens het beste zijn ingevuld.

Voor degenen die gestorven zijn of voor degenen die niet geteld zijn in de modellen E werden een aantal variabelen met betrekking tot de populatiekarakteristieken op nul gezet. Deze informatie recupereren we uit het vorige semester. Voor de dataset op 12 2003 gaan we terug naar de gegevens op 06 2003. Analoog gaan we voor 06 2003 de ontbrekende gegevens halen uit het bestand op 12 2002. Voor een aantal variabelen heeft de waarde '0' een dubbele betekenis. De '0' kan enerzijds wijzen op 'niet geteld in de modellen E', anderzijds op een specifieke code (bv. bij PP0025 heeft de waarde 0 ook de betekenis van 'buitenland'). Voor deze variabelen recupereren we enkel de informatie voor de overledenen.

Op basis van het identificatienummer van de rechthebbende worden eerst de bestanden op 06 2003 en 12 2002 aan elkaar gekoppeld. Hierbij wordt niet toegelaten dat er individuen in 06 2003 bijkomen: personen die gestorven of geëmigreerd zijn in de dataset van 12 2002 zijn niet dus meer opgenomen in de samengestelde dataset. Het gaat over 3,738 personen, waarvan er 1,454 niet gestorven zijn. In de gezamenlijke dataset zitten 300,667 individuen.

Opmerking

38 personen zijn opgenomen in 06 2003 die in de dataset 12 2002 de toestand 'overleden' hadden. Dit zijn fouten en deze observaties worden verwijderd.

Na koppeling van deze dataset met het bestand op 12 2003 bekomen we 303.779 individuen. Deze bijkomende individuen zijn personen die in de loop van het tweede semester geboren of geïmmigreerd zijn.

Opmerking

Voor 179 (niet gestorven) personen ontbreekt essentiële informatie. Deze mensen zijn niet geteld in de modellen E (PP1001=0), niet verzekerd (pp0030=0 en PP0035=0) en hun sociale toestand is 'andere' (PP1003=0). Ook deze observaties worden uit de dataset geschrapt. Hierdoor bekomen we een 'werkset' van 303,562 observaties.

Om een evolutie te kunnen schetsen van de verandering van kosten tussen 2002 en 2003, gaan we ook voor 2002 gegevens recupereren voor de individuen in de finale werkset. Bij

gebrek aan gegevens voor 2001, kunnen we dit hier echter enkel doen voor 12 2002. We bekomen hier een dataset van 301,719 individuen voor 2002.

Opmerking

Analoog gaan we ook hier de personen met ontbrekende essentiële informatie uit de dataset verwijderen. Resultaat is een 'werkset' van 299,678 observaties.

Koppeling uitgavengegevens en populatiekarakteristieken

Vervolgens koppelen we het uitgavenbestand 'catagg' van 2003 aan de werkset van 2003. Er zijn 76 observaties in de consumptiedataset die niet gekoppeld kunnen worden aan de populatiekarakteristieken. Dit komt doordat bepaalde personen die we verwijderd hebben toch een beroep hebben gedaan op de gezondheidszorg. Onderstaande tabel toont dat zij zeer hoge ZIV-terugbetalingen hebben (3,901 euro). Het gewogen gemiddelde van de remgelden en supplementen bedraagt respectievelijk ongeveer 119 en 73 euro.

Tabel 15: Uitgaven van individuen die niet in de populatiedataset maar wel in de uitgavendataset zitten

Variable	Mean	Std Dev	Median	Minimum	Maximum	Sum
totss00060	3,901.28	5,708.13	827.37	0	20,335.22	296,497
totss00160	119.85	159.43	84.31	-298.63	681.12	9,109
totss00165	73.85	239.55	0.355	0	1,359.49	5,612

Omgekeerd zijn er 26,134 individuen aanwezig in de steekproef die geen uitgaven voor gezondheidszorg hadden in 2003. Deze individuen worden vanzelfsprekend wel opgenomen in de analyses.

Verdere uitsluiting observaties voor analyse

Om het definitieve bestand voor de analyses af te bakenen, sluiten we nog enkele groepen van individuen uit, naast de reeds hoger beschreven uitsluitingen. Deze groepen zijn eveneens onduidelijk gedefinieerd of heel heterogeen qua karakteristieken.

Migratie

Immigratie betreft de personen die voor het eerst aanwezig zijn in de dataset van 12 2003 en die ouder zijn dan 0 jaar (dus niet geboren in 2003). We vermelden dat hier misschien een kleine fout kan gemaakt worden doordat de kans bestaat dat er immigranten zijn die in 2003 geboren werden.

Emigratie wordt gedefinieerd als de personen die niet meer aanwezig zijn in 12 2003, en die daarvoor niet gestorven zijn.

Beide groepen van mensen worden niet mee opgenomen in de analyses die we zullen uitvoeren. Het gaat om 1,715 immigraties en 732 emigraties met volgende gewogen statistieken voor uitgaven. Beide groepen hebben gemiddeld genomen iets hogere remgelden en supplementen, maar de immigranten hebben een veel kleiner bedrag aan ZIV-terugbetalingen dan emigranten.

Immigratie:

Tabel 16: Uitgaven van de immigranten

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	393.461	11,073.37	0	62,043.06	26,038,727
totss00160	44.84	740.41	0	2,273.5	2,966,924
totss00165	34.10	2,832.52	0	23,687.57	2,256,601

Emigratie:

Tabel 17: Uitgaven van de emigranten

Variable	Mean	Std Dev	Minimum	Maximum	Sum
totss00060	694.58	19,978.88	0	48,229.35	18,836,823
totss00160	51.61	1,122.19	0	3,942.88	1,399,792
totss00165	28.60	2,062	0	8,872.21	775,621

De personen die geïmmigreerd zijn, komen vooral uit Brussel (21%) en Antwerpen (14%). Opmerkelijk is dat ook voor de emigranten nog 22% in Brussel woont en 10% in Antwerpen. Slechts 18% van de emigranten heeft de status 'in het buitenland of onbekend'.

Meer dan de helft van de immigranten (68,6%) zijn actief. 4% is zelfstandige met recht op kleine risico's. Slechts een klein percentage onder hen behoort tot een categorie die recht geeft op een forfait voor chronisch zieken.

Ook bij de groep geëmigreerde personen is de grootste groep actief (49,6%), een bijna even grote groep is niet verzekerd: 32%. Ook hier zijn er slechts enkelen die aanspraak maken op de zorgforfaits.

14% van de immigranten heeft recht op verhoogde tegemoetkoming tegenover 8% bij de emigranten.

Tabel 18: Populatiekenmerken van de immigranten en emigranten

Variable	Immigratie Mean	Std Dev	Emigratie Mean	Std Dev
prov_00	0.0734	1.6209	0.1836	2.3583
prov_01	0.1423	2.1711	0.1018	1.8416
prov_02	0.0629	1.5081	0.0590	1.4351
prov_03	0.0607	1.4842	0.0324	1.0792
prov_04	0.0698	1.5834	0.0472	1.2917
prov_05	0.0698	1.5834	0.0597	1.4435
prov_06	0.2100	2.5311	0.2212	2.5282
prov_07	0.0329	1.1090	0.0428	1.2325
prov_08	0.0928	1.8028	0.0715	1.5697
prov_09	0.1040	1.8965	0.0870	1.7168
prov_10	0.0357	1.1523	0.0627	1.4764
prov_11	0.0456	1.2967	0.0310	1.0552
PP2001	0.0018	0.2644	0.0037	0.3692
PP2002	0.0000	0.0000	0.0007	0.1653
PP2003	0.0027	0.3236	0.0044	0.4043
PP2004	0.0018	0.2644	0.0000	0.0000
PP2005	0.0015	0.2414	0.0015	0.2337
PP2006	0.0012	0.2159	0.0088	0.5704
PP2007	0.0000	0.0000	0.0007	0.1653
PP2008	0.0000	0.0000	0.0000	0.0000
PP2009	0.0000	0.0000	0.0000	0.0000
PP2010	0.0054	0.4570	0.0074	0.5211
PP2011	0.0030	0.3411	0.0081	0.5464
PP1004_werkloos	0.0266	0.9998	0.0457	1.2723
PP1004_deeltijds	0.0012	0.2159	0.0029	0.3303
PP1004_brug	0.0000	0.0000	0.0007	0.1653
PP1004_rest	0.9722	1.0216	0.9506	1.3200
PP0040B_kw1	0.0000	0.0000	0.0000	0.0000
PP0040B_kw2	0.0000	0.0000	0.0000	0.0000
PP0040B_kw3	0.0000	0.0000	0.0000	0.0000
PP0040B_kw4	0.0003	0.1080	0.0000	0.0000
PP3011	0.0051	0.4442	0.0081	0.5464

Variable	Immigratie Mean	Std Dev	Emigratie Mean	Std Dev
PP3012	0.0030	0.3411	0.0162	0.7695
PP3010_3013_tot60	0.0653	1.5349	0.0206	0.8662
PP3010_3013_va60	0.0057	0.4695	0.0074	0.5211
PP4002_d	0.0209	0.8879	0.0206	0.8662
KG1_00_10080	0.0586	1.4598	0.0317	1.0673
KG1_00_10081	0.1387	2.1478	0.0295	1.0306
KG1_01	0.6860	2.8839	0.4963	3.0454
KG1_02tit	0.0042	0.4033	0.0103	0.6157
KG1_02ptl	0.0121	0.6790	0.015	0.7521
KG1_mindervtit	0.0036	0.3735	0.0007	0.1653
KG1_mindervptl	0.0018	0.2643	0.0007	0.1653
KG1_03	0.0326	1.1041	0.0723	1.5772
KG1_04	0.0136	0.7197	0.0170	0.7865
KG1_05	0.0003	0.1080	0.0000	0.0000
KG1_07	0.0009	0.1870	0.0000	0.0000
AR	0.8008	2.4816	0.6047	2.9779
ZR_zonderKR	0.1037	1.8941	0.0605	1.4518
ZR_metKR	0.0481	1.3290	0.0089	0.5705
NV	0.0468	1.3120	0.3260	2.8550
verhteg	0.1481	2.2070	0.0804	1.6560

Uitbreiding naar MaF-familieleden

In het onderdeel met betrekking tot de imputatie van de hospitalisatieverzekering hebben we ook het MaF-gezinshoofd nodig (kinderen nemen de verzekeringsstatus over van het gezinshoofd). Daarom moeten we ook op volledig analoge wijze de populatiekenmerken van individuen uit deze dataset uit vorige periodes halen.

Ook hier uitsluiting van observaties: 9 personen gestorven in 2002, maar toch opnieuw aanwezig in 2003. Dit zijn fouten en worden verwijderd.

Na de koppeling van alle relevante populatiebestanden en verwijdering observaties is het aantal individuen in de dataset gelijk aan 544,002.

Om de MaF-gezinshoofden te kunnen koppelen aan de steekproef, selecteren we deze personen. Zij hebben een id-nummer (PP0010) identiek aan het nummer van het MaF-gezinshoofd (PP3009). We bekomen een dataset van 146,750 individuen die we vervolgens koppelen aan de selectie van kinderen onder 20 jaar uit onze steekproef (58,050 kinderen).

Opmerking

De koppeling is niet volledig: voor 3,338 kinderen hebben we geen corresponderend MaF-gezinshoofd teruggevonden. De reden is veelvuldig, maar onoplosbaar: het nummer van het

MaF-gezinshoofd is niet altijd ingevuld, soms nul en soms is het nummer van het MaF-gezinshoofd ingevuld bij de kinderen hetzelfde als hun id-nummer.

APPENDIX 2: BEHAVIOURAL IMPACT OF OUT-OF-POCKET PAYMENTS: A LITERATURE SURVEY

Introduction

In OECD countries, health care is largely financed out of public means, either social security contributions or taxes. However, a role is also given to private payments. In a first instance, private payments can relate to patient out-of-pocket payments for uninsured health care. Private payments can also take various forms of patient cost-sharing, which are often combined in practice (e.g. Docteur et al.[1] (2003); van de Ven[2] (2001).

- Deductible (eigen risico - franchise): this is an "all-inclusive amount entirely paid by the patient before insurance cover begins". In this case, the patient pays the full amount of the cost of the service for a given number of services. Thereafter, he/she can get a refund according to the system in the country.
- Co-insurance (procentuele bijbetaling – coassurance): this is a fixed percentage of the price of the service to be paid by the patient.
- Co-payment (remgeld – ticket modérateur): this is a fixed amount per service to be paid by the patient.
- Maximum out-of-pocket or ceilings or stop-loss: these ceilings limit the total amount of out-of-pocket (per year or per sickness episode).

Very often this cost-sharing is rationalised as a way of stimulating efficient behaviour of patients and containing public expenditures within budgetary caps.

To better understand the argument that cost-sharing stimulates rational behavior, we need to introduce the notion of moral hazard. Moral hazard is said to occur if an insured individual tends to increase the likelihood and/or the size of an insured loss. It implies that people will use more health care services when they are insured or more fully insured. The benefit of these marginal services will be equalized to the cost to the patient and not to their full societal cost. Hence the reason to be troubled. Cost-sharing tempers this tendency to consume 'too much'. Especially 'frivolous' use of services for minor illnesses will be curbed, according to the advocates. The efficiency argument however is criticized on the ground that for medical treatment, the patient is ignorant. He can not (always) tell whether health conditions are self-limiting or unresponsive to treatment. He relies on the physician to determine treatment. It is therefore not useful to 'guide' demand through the patient[f].

The recent OECD experience with increasing cost-sharing was often driven from a need to alleviate budgetary constraints faced by many governments[1]. An increase in direct patient contributions reduces public health care costs by shifting part of the cost to recipients of services and by reducing the total volume of services. However, increased cost-sharing can have undesirable distributional consequences. Especially sick people will have to pay a large share of those contributions, and sickness is related to a disadvantaged socio-economic position, e.g. van Doorslaer et al.[4] (1997). Additionally increased patient payments can lead to increased (complementary) private insurance, resulting again in undesirable distributional consequences (as richer people are more likely to buy this kind of insurance rather than the poorer and probably more needy individuals), and possibly increased consumption with increased public expenditures (because of moral hazard issues).

[f] For a full discussion, see e.g. Rice[3] (1998) chapter 3.

The primary purpose of this chapter is to provide up to date information on the impact of out-of-pocket payments on health care utilization and expenditures and on the distributional consequences thereof. As Cutler et al.[5] (2000), Zweifel et al.[6] (2000) and Docteur et al.[1] (2003) already summarize the available evidence from the period prior to 2000, we will limit ourselves to the period from 2000 (until March 2005).

In the next paragraph, we will first give an overview of the current situation with respect to private financing sources and will summarize available evidence on the impact of out-of-pocket payments as described in the existing reviews. In the following paragraphs, our own findings will be discussed.

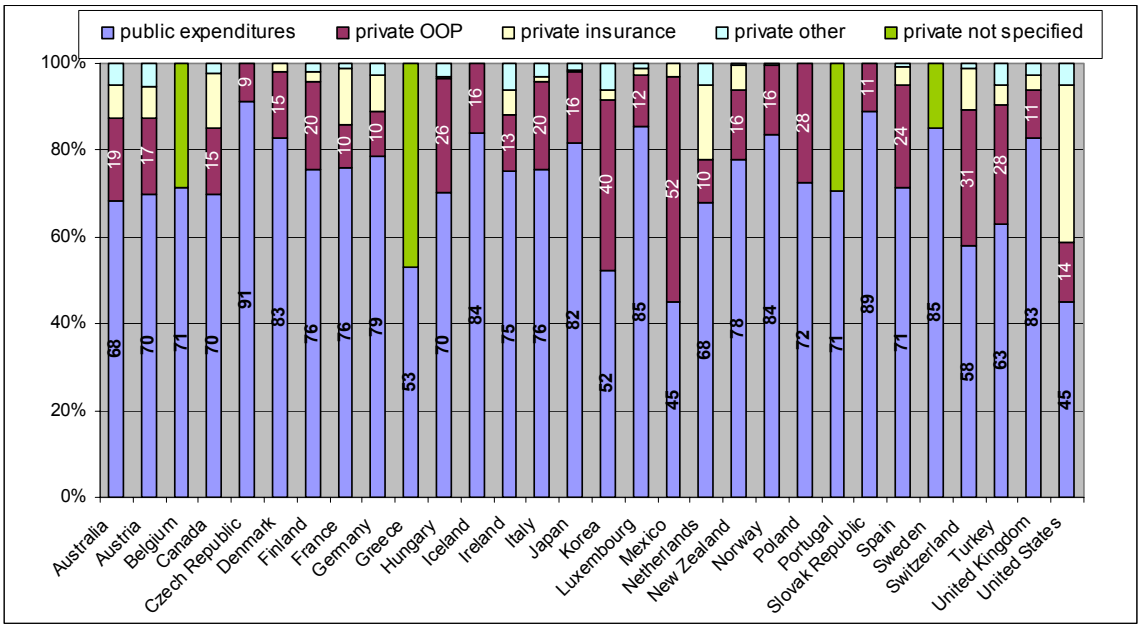
Context

Importance of financing sources in OECD countries

For the interpretation of the impact of cost-sharing the context of the country may be of importance. We therefore give a broad overview of the financing situation of OECD members together with some important figures. For this overview we rely heavily on Docteur et al.[1] (2003) who extensively describe the evolution of reforms in the OECD countries in order to keep track with the ever growing expenditures on health. The description of the systems of private health insurance is derived from Colombo et al.[7] (2004).

Figure 1 shows that all OECD countries use public as well as private financing for health care. Moreover, public expenditures outweigh private expenditures in most countries; exceptions are the United States and Mexico. Of 25 countries for which data are available for 2002, 20 have a share of 70% or more for public expenditures. Striking is the large variation between the countries in terms of private health insurance and out-of-pocket payments (no data available on these expenditures for Belgium, Greece, Portugal and Sweden). From the figure it can be seen that private health insurance represents, on average, only a small share of the total health expenditures. In only four countries, private health insurance represents more than 10% of total health expenditures: US, the Netherlands, France and Canada. These same countries (with exception of Canada), are the only ones with private health insurance financing a higher share of private financing than out-of-pocket payments. Private insurance can have different roles. It can be primary source of health coverage for part of the population; it can offer duplicate private cover in public systems, it can give supplementary cover in case of cost-sharing or finally complementary cover for uncovered services[7]. Details on population coverage and type of coverage can be found in Table 1 .

Figure 1: Financing sources for health care (% of total expenditures on health care), 2002



Source: based on OECD Health data, 2004, 3rd edition. Data for 2002; except for Australia (2001), Japan (2001), the Netherlands (total health expenditures for 1997), Turkey (2000) and UK (1996)

Table 1: Private health insurance: share of total expenditures, population covered and type of coverage, 2000

	PHI (% of total health expenditure)	Population covered by PHI (%)	Types of private coverage		PHI (% of total health expenditure)	Population covered by PHI (%)	Types of private coverage
Australia	7.3	44.9 40.3	Duplicate, Complementary Supplementary	Korea	n.a.	n.a.	Supplementary
Austria	7.2	0.1 31.8	Primary (Substitute) Complementary, Supplementary	Luxembourg	1.6	2.4	Complementary, Supplementary
Belgium	n.a.	57.5	Primary (Principal) Complementary, Supplementary	Mexico	2.5 (2001)	2.8	Duplicate, Supplementary
Canada	11.4	65.0(e)	Supplementary	New Zealand	6.3	35	Duplicate, Complementary, Supplementary
Czech Republic	0(e)	negligible	Supplementary	Norway	0(e)	negligible	n.a.
Denmark	1.6	28 (1998)	Complementary, Supplementary	Netherlands	15.2	92 *of which:* 28.0 64(e)	 Primary (Principal) Supplementary
Finland	2.6	10	Duplicate, Complementary, Supplementary	Poland	n.a.	negligible	Supplementary
France	12.7	92	Complementary, Supplementary	Portugal	1.5 (1997)	14.8	Duplicate, Complementary, Supplementary
Germany	12.6	18.2 *of which:* 9.1 9.1	 Primary (Substitute) Supplementary, Complementary	Slovak Republic	0(e)	negligible	Supplementary
Greece	n.a.	10	Duplicate, Supplementary	Spain	3.9	13 *of which:* 2.7 10.3	 Primary (Substitute, Principal) Duplicate, Supplementary
Hungary	0.2	negligible	Supplementary	Sweden	n.a.	negligible	Complementary, Supplementary
Iceland	0(e)	negligible	Supplementary	Switzerland	10.5	80	Supplementary
Ireland	7.6	43.8	Duplicate, Complementary, Supplementary	Turkey	0.7 (1994)	< 2	Complementary, Supplementary
Italy	0.9	15.6 (1999)	Duplicate, Complementary, Supplementary	United Kingdom	3.3 (1996)	10.0	Duplicate, Supplementary
Japan	0.3	negligible	n.a.	United States	35.1	71.9	Primary (Principal) Supplementary, Complementary

Notes: Negligible indicates a proportion covered of less than 1%; PHI: Private health insurance; n.a. indicates not available; (e) Estimated.
Source: OECD (2004). Private Health Insurance in OECD countries.

Source: OECD[8] (2004)

Docteur et al.[1] (2003) indicate that an increase in cost-sharing for medical care has been a common feature over the 1980s and, particularly, the 1990s. The main consequences of increasing cost-sharing can be seen for pharmaceuticals rather than inpatient and doctor visits. Fewer drugs are being reimbursed, especially 'comfort drugs' and drugs without proven therapeutic value, and a smaller amount of many others is refunded to the patient. Examples of policies are the introduction of flat-rate payments per prescription and reference price systems. To alleviate the possible undesired effects on access and additional social costs, many countries exempted vulnerable groups (e.g. the poor, elderly) through setting maximum amounts on annual spending on health care or allowing complementary insurance[1].

Impact of out-of-pocket payments: previous evidence

Zweifel et al.[6] (2000), Docteur et al.[1] (2003) and Cutler et al.[5] (2000) summarize a large number of studies mostly published during the '70s, '80s and '90s regarding the impact of cost sharing. In general they warn to be cautious with the results, because of problems with the data and statistical techniques. These difficulties relate to self-selection, absence of a control group, endogeneity of effective price and impact of supply-side.

- *Self-selection* is especially pertinent in cross-section studies comparing groups of individuals with different types of insurance or cost-sharing. Insurance or cost-sharing are endogenous and individuals with higher incomes and those expecting to face larger health-care bills are more likely to take more complete insurance coverage. Therefore less cost-sharing

may seem to generate more consumption of medical care, whereas the reason lies in the characteristics of the individuals. Unfortunately, it is difficult to perfectly control for this.

- *Absence of a control group* is a second problem. Studies comparing consumption before and after an exogenous increase in cost-sharing can have biased estimates, because the effects of other variables that have changed over time are confounded with the change in cost sharing.
- Very often the *effective price paid by the patient depends on the quantity* of care demanded. For example, when co-payments or co-insurance are combined with an annual ceiling, so as to limit the impact of health costs on household budgets, the effects of cost-sharing are difficult to estimate, as the behaviour of households will depend on whether, at the time of a sickness episode, they expect to surpass the ceiling, after which the cost of additional units of care becomes free.
- Finally, the impact of out-of-pocket can be influenced by *supply-side effects*. For example, the impact of large decreases in cost-sharing for large groups is difficult to estimate if supply is fixed in the short run and increased demand is reflected in increased waiting time.

All authors therefore still pay a lot of attention to the results derived from the Health Insurance Experiment (HIE) carried out in the US in the period 1974-1982. In the HIE, individuals were randomly assigned to different types of plan and their behaviour compared. The advantage of this experiment over dealing with existing databases is that there is no self-selection problem thanks to the randomized system to appoint a type of insurance to a family. The major disadvantage for us is the fact that it concerns an experiment in the US, which has a different health insurance system than (most) European countries and that it may be outdated.

Some conclusions from the reviews:

- Demand elasticity is negative: individuals react to price in health care. But the effect is relatively small. Most elasticity estimates are in the range of -0.2 to -0.1 for co-insurance under 25 per cent but could be somewhat higher if the rate of co-insurance is raised substantially above this level (HIE). A number of (especially early) studies report larger elasticities for some types of care, but there is less confidence in these coefficient values (self-selection and other problems). But even with small elasticities, the impact on expenditures can be large, particularly when the co-payment or co-insurance rate is near to zero to begin with. The results from the HIE indicate that a move from a zero co-insurance rate to a 25 per cent rate for all care would reduce spending with between 20 and 25 per cent. Subsequent change from 25 to 50 per cent co-insurance leads to a significantly smaller proportionate change (eight to nine per cent).
- The price elasticities do not vary greatly with income or health state (but stop-loss was income dependent) (HIE).
- Differences in the volume of health care generally take the form of reductions in the number of sickness episodes treated rather than the intensity of treatment once a cycle of care is initiated.
- Care of a low marginal value (inappropriate, less effective care) is reduced as much as other care (HIE).
- Although there is variability across studies, the most elastic components of care are ambulatory/outpatient care and for pharmaceutical drugs and the lowest concern specialist visits and hospital treatment. This is consistent

with the view that individuals initiate ambulatory-care visits and are, therefore, more sensitive to price while, at the level of the hospital, treatment is dictated to a greater degree by doctors.

- In the HIE the price elasiticities are similar for well care, prescription drugs, emergency room visits and other general health care. Preventive services and outpatient mental health tend to be more price sensitive. Hospitalization of children and emergency care (not emergency service use) are price insensitive.
- Evidence indicates that health status was not influenced by cost-sharing. But it cannot be excluded that this was due to measurement problems. Dental care and controlling high blood pressure did appear to be a problem for the poor (HIE). The poor and sick generally did better under a free than a cost-sharing plan.
- There may also be a dynamic moral hazard effect; it induces to ask for the latest technology.

In the following paragraph, we will update this information on the basis of new evidence, published in the period 2000-2005.

Search strategy

We did not perform a systematic review, but we attempted to do as broad a search as time allowed. We searched EconLit, a database collecting over 400 periodicals in the economic science. We limited our search to (1) articles (2) published in peer reviewed journals (3) since 2000 (search performed in March 2005). The abstracts and titles were screened on the presence of the following search terms:

("health care" OR "medical care" OR "health service*" OR "hospital care" OR "physician service*" OR "physician utilization" OR "GP care" OR "drug*" OR "specialist*" OR "medical service*" OR pharmaceutical* OR doctor* OR hospitalisation* OR hospitalization*)
AND

("co-payment*" OR "copayment*" OR "out-of-pocket" OR "cost shar*" OR "co-insurance" OR "coinsurance" OR "deductible*" OR "patient charge*" OR "user charge*" OR "user fee*" OR "insurance")

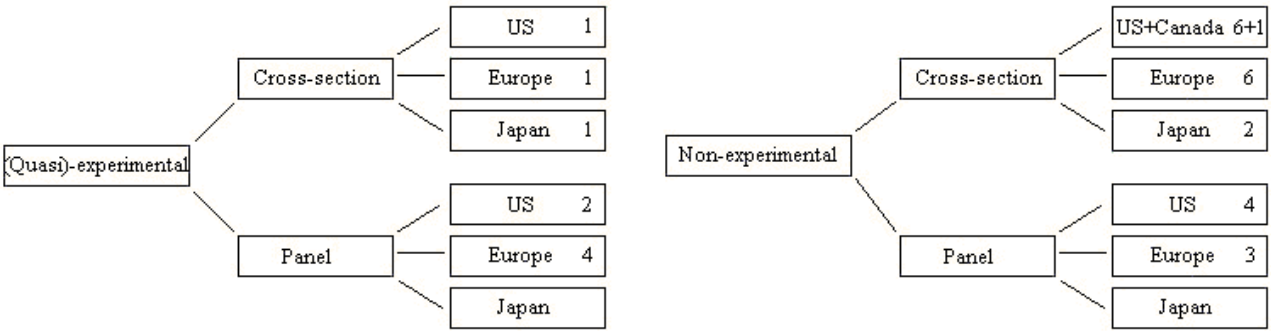
We used no language restriction. All the abstracts of the articles thus found were read. All solid quantitative research relating to OECD countries was retained. Policy reviews, describing or critiquing policies or (small-scale) descriptive case studies with qualitative information were not retained. Additionally, references from these articles and literature known to the authors were reviewed.

Using the search algorithm in EconLit, we retrieved 169 articles; 24 articles contained quantitative information on the effect of patient direct payments on health care consumption, expenditures or distributional consequences. 7 additional articles were added to this list.

Of the articles we retrieved, there are in total 18 cross-sectional studies (where 4 of them compare several cross-sections with each other) and 13 panel analyses. We reach approximately an equal number of US studies (13) compared to European studies (14). There is also 1 Canadian study and 3 studies based on Japanese data.

Figure 2 gives a clear schematic overview of the different kinds of articles.

Figure 2: Scheme of articles



The majority of studies (22) are non-experimental. That is, based on existing survey data, the authors try to develop models to explain differences among people with and without a certain type of coverage. Further, there are eight 'before and after' studies, classified here as quasi-experimental studies, in which the introduction of an intervention (e.g. cost-sharing increase) is examined. Most of them compare the results of a treatment group and a control group to investigate the impact of the policy measure. Unfortunately, these groups are not random chosen but rather taken from exclusion groups for instance on the basis of income. We also found one article further analyzing results from the Rand HIE.

Most studies examine the demand for physician visits. Attention goes to the demand for any physician visit and the number of general practitioner and specialist visits. There are studies that compare the impact of insurance on different kind of specialists. Next, a stream of studies are about hospitalization, including a study about child hospitalization, access to hospitalization, and several studies about hospital services. Related with the demand for care we also find several articles investigating the expenditures on several health services or on pharmaceuticals. Further, the impact of cost-sharing on preventive examinations is analysed. The impact on the demand for care for minor ailments is studied as well. Lastly, we have studies comparing the impact of cost-sharing among different subgroups (e.g. minorities versus whites, or sick versus healthy people).

There are five studies of those we obtained, that investigated the difference among individuals with and without certain types of insurance solely based upon frequency tables or odds ratios. These are not dealt with in the rest of this overview as the impact of insurance is likely to be influenced by several covariates and therefore examining the impact of insurance will be inadequate on the basis of this method. All of them were non-experimental studies. Three studies analyse US data and two studies are about Europe.

In Table 2 we summarized the most relevant studies.

Table 2: Results from selected articles

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
Alan et al.[9] (2002)	Canada 1969, 1974, 1986, 1990, 1992,1996	variation in co-payments or deductibles over time	introduction of prescription drug plans: fall of household expenditure share on prescription drugs; and vice versa		urban senior population
Bao et al.[10] (2004)	US 1998 and 2001	introduction of state mental health parity legislation	parity versus no/weak parity has little if any impact on mental health specialty care of individuals with mental disorders relative to those without disorders		1) law is not binding for self-insured (cannot be distinguished) 2) consumers may not be aware of change 3) managed care may be accelerated 4) selection effects
Buchmueller et al.[11] (2004)	France 1998	supplemental insurance	1) increase of probability of having at least 1 physician visit 2) insurance not significant for choice between GP and specialist		1) people exempted to pay 'ticket modérateur' excluded 2) short time period: few multiple visits 2) endogenous nature of insurance not taken into account

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
Cockx et al.[12] (2003)	Belgium 1993-1994	increase of coinsurance in 1994 by: 48% GP office visits (1), 35% GP home visits (2), 60% specialist visits (3)	reduction of demand for all types of services	uncompensated PE: Men Women 1 -0.06 -0.01 2 -0.18 -0.08 3 -0.14 -0.02 IE: Men Women 1 0.47 0.32 2 1.38 2.24 3 (1.11) 0.55	1) only data on individuals within general scheme 2) lower income groups only 3) probability that deductible would be exceeded not taken into account
Courbage et al.[13] (2004)	UK 2000	supplemental private health insurance versus NHS only	private insurance leads to more non-insured preventive activities		
Dafny et al.[14] (2005)	US 1983-1996	Medicaid expansions late 80s –early 90s	increased eligibility associated with increase in child hospitalization, unavoidable hospitalizations>>avoidable, probability of having a procedure increases, length of stay declines, impact on average cost is ambiguous		
Deb et al.[15] (2002)	US Rand HIE	different plans	latent class model (non-ill/ill) is preferred over two-part model (use/non-use and positive use)	larger sensitivity at lower prices	

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
Hadley et al.[16] (2003)	US 1996-1999	simulations: Medicaid versus private insurance	if Medicaid enrollees were given private coverage, expenditures would be higher and vice versa		1) lower income people (<200% of poverty level) 2) endogenous nature of insurance not taken into account
Hargraves et al.[17] (2003)	US 1996/97-1998/99	insurance coverage versus no coverage	lack of insurance plays a major role in differences in access to care between Hispanics, African Americans and whites		1) exclusion of >65 year and members of US military
Harmon et al.[18] (1994)	Ireland 1994	supplemental insurance	supplemental insurance leads to higher probability of having had a hospital stay		people with employer-provided cover are excluded
Hong et al.[19] (2000)	US 1995	different life cycle stages	insurance leads to higher spending		1) no data on price of health care 2) endogenous nature of insurance not taken into account
Ii et al.[20] (2002)	Japan 1986, 1989, 1992, 1995	coinsurance rate	1) significantly negative effect on demand for medical services in case of minor ailments 2) no significant effect on demand for OTC medicine	average PE for workers: -0.149, total sample: -0.144	1) no price data available from the survey 2) only 22-59 y 3) endogenous nature of insurance not taken into account
Ii et al.[21] (2002)	Japan 1997/1998	coinsurance rate		PE medical services varies between -0.23 and -0.36 PE OTC between 0.40 and 0.30	1) 22-59 years 2) endogenous nature of insurance not taken into account

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
Jones et al.[22] (2004)	Ireland, Italy, Portugal, Spain, UK 1994-1997	supplemental insurance	positive effect on probability of specialist visits in all countries; magnitude depends on model		
Lundin[23] (2000)	Sweden 1992-1993	change in reimbursement system from no reimbursement under certain deductible/cost to reference price system	physicians are more likely to prescribe generics in the reference price system		
Meer et al.[24] (2004)	US 1996-1998	insurance versus no insurance	1) significant positive effect of insurance on different types of health care utilization 2) reduction of out-of-pocket medical expenditures		
Remler et al.[25] (2003)	US 1995	supplemental insurance	sick are less responsive to supplemental insurance	elasticity for those in better health: 36%, poorer health: 12-18%	1) elderly (>65) only 2) endogenous nature of insurance not taken into account
Riphahn et al.[26] (2003)	Germany 1984-1995	add-on insurance	doctor and hospital visits not significantly affected by whether individuals are privately or publicly insured but doubts for no moral hazard effects	higher elasticity in demand for outpatient rather than inpatient care	endogenous nature of insurance not taken into account
Rodriguez et al.[27] (1997)	Spain 1997	comparison of NHS only, private insurance only, duplicate coverage	1) having private insurance only or duplicate coverage increases probability of visiting a specialist 2) conditional on 1, more private visits than public visits		1) only small percentage for private only group 2) endogenous nature of insurance not taken into account

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
Schellhorn[28] (2001)	Switzerland 1997	introduction of choice of deductible in 1996	1) higher deductible associated with reduction in number of physician visits but are results of self-selection rather than changed utilization behaviour		1) data collection shortly after reform 2) probability that deductible would be exceeded not taken into account
Thomas et al.[29] (2001)	US 1987	public versus private coverage	increasing private insurance coverage to minority populations will not eliminate racial and ethnic gaps in professional help-seeking for outpatient mental health care		1) only insured people included 2) mental health treatment for ethnic minority groups
Tye et al.[30] (2004)	US 1996	different characteristics of health plans	1) women in plans with a defined network of providers and women in gatekeeper plans are more likely to be screened than plans that did not have this feature 2) the variables for co-payment amount for doctor visit, deductible amount for doctor visit and coinsurance rate do not significantly affect the probability on screening		1) women>40, privately insured, no history of breast cancer 2) cost-sharing indicators are poorly measured: they are based on out-of-pocket costs for a general office-based doctor visit, instead of a specific mammography appointment
Van de Voorde et al.[31] (2001)	Belgium 1986-1995	increase of coinsurance in 1994 (see higher)	price increase does not only invoke cost shifting to patients, but also some demand reduction	PE General population: GP home visits: -0.39, GP office visits:-0.16, specialist visits: -0.10 Higher income WOPI: GP home visits: -0.08, GP office visits: -0.06, specialist visits: -0.06	1) short-run effects 2) probability that deductible would be exceeded not taken into account

Author (year)	Country year(s)	Change in cost sharing	Impact on care consumption	Estimated elasticity PE=price el., IE=income el.	Comments
van Vliet[32] (2001)	The Netherlands 1990-1994	deductibles	expected average co-payment has a negative effect on all types of short term care considered	PE all health expenditures: -0.079; physiotherapy: -0.12, GP: -0.085, specialist: -0.074, prescription drugs: -0.056, and not significant for dentist: -0.014 and hospital: -0.007	only privately insured
Winkelmann[33] (2004)	Germany 1995-1999	increase of co-payment rates for prescription drugs in 1997 by fixed amount of 6DM (i.e. up to 200%)	there is a drop in number of doctor visits in the post-reform period		
Yoshida et al.[34] (2002)	Japan 1996-1998	increase of coinsurance in 1997		IE for base case with income of ¥300,000 doctor visits -0.11 before and after reform and reseputo: -0.05 before and -0.07 after reform PE reseputo: -0.19 PE doctor visits: -0.25; after reform PE about 40% of before reform PE	1) people that died or resigned in the period are excluded: underestimation 2) influenza epidemic in post-reform period: underestimation

General empirical findings

In this part of the chapter we give an overview of the findings in the different studies reviewed. We split the results of the impact of cost-sharing in four large parts on: (1) the type of health care, which is subdivided in ambulatory care, hospital care, drugs and some general findings, (2) the type of complaint, (3) prevention, and (4) compared between groups in different health, minority groups and income categories.

Impact of cost-sharing and type of health care

Ambulatory care

It is clear that there is a measurable reaction of the demand for health care to price changes. Having insurance significantly increases the probability of seeing a general practitioner (GP), a specialist (e.g. chiropractor, alternative carer, dentist, optometrist) as well as the number of visits (e.g. Meer et al.[24] (2004)). Only one study, performed in France, did not find a significant effect on the number of visits, albeit they estimated a positive impact of supplemental insurance on the probability of having at least one physician visit. This is probably due to the short time period considered in their analysis: only one month. As such, few people had multiple visits [11]. Rodriguez et al.[27] (2004) examine the choice between GP versus specialist and public versus private sector (conditional on having had a doctor's visit) in Spain. As they only look at the last visit (people with at least one visit in the 14 days prior to the interview), they think they can keep insurance exogenous, which is confirmed by a test statistic. The results show that having only private insurance or having duplicate insurance leads to an increased probability of visiting a specialist instead of a general practitioner. Conditional on visiting a specialist, the patient with only private or duplicate insurance is significantly more likely to go to the private sector rather than the public sector. The authors remark that the 'private only' group is very small (only 3.5% of the sample).

We clearly see from these results that the impact of insurance on utilization is positive. However the magnitude must be interpreted carefully. As Jones et al.[22] (2004) show in their comparison of five European countries (Ireland, Italy, Portugal, Spain and the UK), the utilization effect depends on the model that is being used. When using the conventional probit model, they consistently find a positive association between private insurance and the probability of visiting a specialist in all countries. The magnitude of the coefficients differ from country to country but are rather close to each other, varying from 0.06 (Ireland) to 0.12 (Spain). Other models give more divergent results and the effect of insurance is reduced. Lastly, the choice of the instrument to take endogeneity into account is also important: where X is a good instrument for one country, this is not necessarily the case for other countries.

In Germany, the cross-price elasticity of prescription drugs on physician visits is analyzed. In 1997, an increase of the co-payment of prescription drugs by a fixed amount of 6 DM (resulting in an up to 200% increase depending on the package size) was imposed. This reform could have a direct effect (reduced number of drugs purchases) and an indirect effect (decline in doctor visits). Winkelmann[33] (2004) investigates the latter by comparing a treatment with a control group which is exempted from the increase (i.e. co-insured children under 18, poor people and people with private insurance). He finds that increasing co-payments for prescription drugs indeed leads to a decline in doctor visits by 10% on average. Also in Germany, Riphahn[26] (2003) use a count model to investigate possible moral hazard effects of private insurance. At first, the results do not show a significant difference between people with private insurance and those covered by public insurance. This is the case for doctor visits and for hospital visits as well. Moreover, it seems that the cost-sharing characteristics of private insurance (i.e. with or without deductible) also do not affect health care demand. However, the fact that the suggested absence of moral hazard is correct is doubted by other estimations results. First, there is a correlation between add-on insurance and higher demand for hospital visits. Second, self-employed individuals, who do not receive compensation for a doctor visit, have significantly fewer

doctor visits than other individuals. And finally, the presence of children leads to a significant decline in doctor visits for females.

Additional studies analyze the impact of cost-sharing characteristics of insurance. In Switzerland for example, a choice of deductible was introduced in the mandatory basic health insurance in 1996. Schellhorn[28] (2001) estimates the impact of the deductible on the number of physician visits, taking into account the endogeneity of the choice of the deductible. He observes that the probability of taking a higher deductible is positively affected by the existence of supplemental insurance cover and that a higher deductible is associated with a lower number of doctor visits. However, this seems to be the result of self-selection rather than a change in utilization behaviour. It is however noted that the data gathering takes place only one year after the reform, which may be too short to induce behavioral changes.

Results of the US confirm those of Switzerland. The US introduced in 1996 a mental health parity legislation which prohibits that the insurance benefits for mental health care can be more restrictive as compared to benefits for medical and surgical services. It does not allow different dollar limits for mental health and medical care in employer-provided insurance plans. However, differential limits in terms of hospital days and outpatient visits as well as differential cost-sharing features such as co-payments, coinsurance, or deductibles can still remain. As such, there were no substantial changes in consumers' health benefits, their access to mental health care, or health care costs related to the parity bill. However, the federal legislation may have had an important symbolic value and encouraged many states to follow up with stronger mandates. Bao et al.[10] (2004) investigate the impact of this legislation. As it is only applicable for private insurances, they limit their analysis to the adult population that has employer-provided or individual insurance. In addition, they may have some form of public insurance. On the basis of the model that controls for individual covariates, the results present no or very little impact of the parity legislation. The results of this analysis, however, must be interpreted cautiously. The lack of significance may be due to the fact that the authors were not able to distinguish self-insured plans (for which the law is not binding) from the other plans. Also, consumers may not be aware of the changes and there may be some self-selection of states.

Yoshida et al.[34] (2002) calculated price elasticities for outpatient medical care in Japan both before and after the reform (increase in coinsurance rate of the family head). The price elasticity is negative, indicating that an increase in the price of health care leads to a decline in demand by the consumers. They find that the family head as well as the dependents are less price elastic after the reform. Price elasticities change from -0.25 for doctor visits or -0.19 in case of reseputo (bills) to about -0.08 to -0.11 respectively. The income elasticities are quasi constant: -0.10 before and after the reform for doctor visits; and a change of -0.05 before to -0.07 after the reform in case of reseputo. However, the reform effects may be underestimated for two reasons. First, there is an underrepresentation of younger individuals and people >60 years. Second, in the post-reform period there was an influenza epidemic.

The two studies for Belgium also found negative price elasticities. They both examine the impact of the 1994 increase in coinsurance for GP office visits (48%), GP home visits (35%) and specialist visits (60%). Van de Voorde et al.[31] (2001) use data from 31 regional offices of the Christian Mutualities for a period of 10 years. They estimate a levels model (deviations from the time trend) and a differences model (deviations from the control group, which are the low income WOPI, i.e. the widowed, disabled, retired or orphaned individuals without professional activity). Based on the levels model, the hypothesis of zero price elasticity can be rejected for the general population and for the WOPI; the low-income WOPI results are not very informative because this group is exempted from the price increase, and as such there is a lack of price variation. More detailed, the elasticity for the general population for GP home visits is much larger (-0.39) than for GP office visits (-0.16) or specialist visits (-0.10). A similar pattern but much lower in absolute value can be seen for the higher-income WOPI group that is not exempted. In case of the differences model, the resulting price elasticities are much smaller in absolute value and not significant any more for the WOPI group.

Cockx et al.[12] (2003) use grouped data from a Belgian sickness fund for Liège and Ghent. They only have data on individuals within the general scheme (so neither data for individuals in the special scheme for specific professions (e.g. miners and sailors from merchant navy) nor for self-employed people is included). They use difference-in-difference estimators with as control group the widowed, disabled, retired or orphaned individuals without professional activity with income below a certain level that are exempted from contributions and enjoy reduced co-payment rate. In their analysis, contrary to Van de Voorde et al.[31] (2001), substitution effects within the group of three physician services is explicitly allowed for by estimating a system of demand equations derived from the theory of consumer demand and the principles of two-stage budgeting. The results show that, for lower income groups, the price elasticity for physician demand is -0.13 for men and -0.03 (insignificant) for women. The price elasticity for GP home visits is largest: -0.18 for men and -0.08 for women, for specialists -0.14 and -0.02, and for GP office visits the elasticities are -0.06 and -0.01. The own elasticities for GP office visits are larger than for the other two types of physician services. Moreover, GP home and specialist visits seem to be (weak) complements. Cockx et al.[12] (2003) also investigate the income elasticity. They conclude that GP home visits are luxuries for both men and women, with an income elasticity of 1.38 and 2.24 respectively. On the contrary, GP office visits are necessities: 0.47 (men) and 0.32 (women). For specialist visits, there is a difference: it is a luxury for men (1.11, but not significant) and a necessity for women (0.55).

In the Netherlands, van Vliet[32] (2001) also calculated price elasticities of health care demand. Therefore, he relates medical consumption to co-payment rates resulting from deductibles. However, in the analysis he uses a transformation of the deductibles (an approximation of the average payment rate) rather than the deductibles itself. This is to take into account the role of expected health care expenditures at the policy level. Further, he only focuses on the privately insured individuals (32% of the Dutch population). The results show that the expected average co-payment has a negative effect on all types of consumption considered. The estimated price elasticity of health care demand is -0.079. It is significant for physiotherapy (ε=-0.12), GP visits (ε=-0.085), specialist visits (ε=-0.074) and prescription drugs (ε=-0.056) and not significant for visits to the dentist (ε=-0.014) and hospital care (ε=-0.007). In the analysis, insurance coverage is treated as exogenous because in the Netherlands it is unlikely that people switch to another insurance company or to another plan. As such, the correlation between coverage and health status will drop after some years.

Hospital care

The probability of a hospital stay, inpatient as well as outpatient, also increases significantly when individuals have insurance. Taking into account the endogeneity of insurance, the effects are larger[24]. A study in Ireland by Harmon et al.[18] (2001) looks at the impact of buying supplemental insurance while there is public hospital care for everyone. In the analysis, they exclude people with employer-provided cover. The results show that the probability of a hospital stay is 3% higher for those that have private health insurance and 1.5% higher when having a medical card. When the endogenous nature of insurance is taken into account these effects approximately double. Moreover, the mean length of time in a hospital is also longer for privately covered than for patients with no cover. However, patients having a medical card (i.e. full free health care from the state) stay even longer in the hospital than the privately insured. One must be cautious with the results of the medical card holders as these tend to be individuals with lower income and in poor health status.

In the US, Dafny et al.[14] (2005) concentrate on the impact of expansions in access to public health insurance for low-income children on child hospitalizations over the period 1983-1996. They group the individual hospital data into cells based on four age categories for each state and year and instrument the actual eligibility by a 'simulated eligibility' because of the possible endogeneity of the actual eligibility (small sample size by age and state in some cells and omitted variable bias – e.g. recession). The estimates indicate that a 10 percentage point increase in Medicaid eligibility is associated with an 8.4% increase in child hospitalization. Further the probability of having a procedure and

the average number of procedures also increases significantly with respectively 6.6% and 5%. On the other hand, the length of a stay declines by 3.1%. For these reasons (decrease in length of stay but increase in number of procedures), the impact on the cost is ambiguous.

Drugs

Alan et al.[9] (2002) look at the impact of prescription drug subsidies for elderly (65 and over) in Canada using semi-parametric estimation. Their analysis is restricted to urban respondents. When prescription drug subsidies are introduced between 1969 and 1986, the household expenditure share on prescription drugs falls for everyone. But the largest impact was seen on the middle range and only a small drop was noticed at high outlays. On the other hand, when prescription drug plans were reduced between 1986 and 1996, the budget shares increase by almost the same amount across the whole range of total outlays.

There is one article that investigates the prescription behavior of the physician after a cost-sharing reform. In Sweden, before the reform in 1993 there was no reimbursement of drugs below a certain price and below a certain deductible. Above these limits, the costs were fully reimbursed. The reform introduced a reference price system in which drugs are reimbursed for a part of the costs below the reference price (i.e. cheapest generic drug +10%). [23] examines whether or not the physician increases the prescription of the generic version of the drug. Therefore, the author uses data on all prescriptions of seven drugs dispensed by two pharmacies with a maximum of 50 prescriptions per physician. From the results it seems that physicians are more likely to prescribe generics after the reform, regardless of the cost for the patient.

General findings

This changed behavior of demand for health care leads to another pattern in the expenditures of an individual or household.

Studies find that having insurance leads to a significant decrease of the out-of-pocket medical expenditures. While conventional probit estimates indicate that having insurance significantly reduces the probability of having extraordinarily high expenditures, a model accounting for endogeneity of insurance remains inconclusive[24].

Hadley et al.[16] (2003) examined the differences for lower-income people only using a two part approach. They conclude that adults with private insurance have significant lower per capita medical expenditures than those with Medicaid coverage. This is not the case when those with poor and fair mental health or physical limitations are excluded. For children, the expenditures are higher but not significantly different under private compared to Medicaid coverage. However, in each case, the out-of-pocket expenditures are significantly larger for privately insured than those under Medicaid coverage. Furthermore, the authors conclude that the differences between private and Medicaid spending are primarily due to differences in payment rates and not to lower utilization by Medicaid enrollees.

A study of Hong et al.[19] (2000) in the US, using a simple OLS regression, concludes that insurance coverage is a significant predictor of the household budget share for health care. Fully and partially insured households spend on average respectively 21% and 16% more on health care than the uninsured households. Also the life cycle stage plays a significant role. In these results, however, as the authors recognize themselves, there may be a simultaneous equation bias because the insurance dummy variables are endogenous and this is not accounted for.

Impact of cost-sharing and type of complaint

In this section, we want to draw a distinction between the impact of insurance on different types of complaints: serious diseases versus minor illnesses. However, using our search strategy, we only found two Japanese studies on minor illnesses. Both stem from the same authors.

First, Ii et al.[20] (2002) estimate the price sensitivity for minor ailments. They focus on people between 22 and 59 years suffering from minor ailments. These are defined as illnesses that are neither chronic nor serious. Therefore, people that are hospitalized or permanently bedridden (i.e. for at least one month) or have acute and serious illnesses are excluded from the sample. Further, the authors assumed that patients with minor ailments have three options: (1) they can consult a doctor, (2) they can purchase over-the-counter (OTC) medicines or (3) they can do nothing. Two hypotheses are tested: 1) whether medical services are normal goods and 2) whether medical services are substitutes for OTC medication. The data come from 4 different years (1986, 1989, 1992 and 1995) but are not a panel because 2000 areas were randomly chosen in each year. A problem in the study is that price information is very limited. For the prices of medical services, the type of insurance of the patient (employees' insurance or national health insurance) and the insurance status (insured or dependant) is used as a proxy. The coinsurance rate for individuals in the system of employees' insurance (about 65% of the population <70 years) is 10%. Their dependents and people under the national health insurance system (about 35%) have a coinsurance rate of 30% for outpatient care. Coinsurance is included as a dummy variable indicating whether the individual has a rate of 10% or 30%. There is also a lack of prices for OTC medicines; prices are proxied by year dummies (everyone faces the same price in the same year) and prefecture dummies representing regional variations. The results from their multinomial probit model show that an increase of coinsurance rate leads to a decrease in medical demand. The estimated price elasticity for workers is -0.149 on average, and is -0.144 on average for the total sample. As detailed information is available for 43 subjective symptoms, price elasticities are estimated (but not reported) for each of them. For almost half of the symptoms, the estimated price elasticity was below one. The effects of the coinsurance rate on OTC medicine seem insignificant.

Ii et al.[21] (2002) focus on how coinsurance rates affect the demand for medical services and OTC medications for patients suffering from a common cold. In this study, they conduct a survey in two areas of Japan. A difference with the previous study is that there is better information on prices of OTC medicine. Instead of dummies, they now use prices of one popular brand. However, this must still be handled carefully as (1) the prices are collected from pharmacies in the two participating areas and thus may reflect competition and (2) it only concerns one brand and as such may not represent the whole OTC market. Also, instead of dummies for coinsurance rate, they now use the percentage. The analysis again focuses on those aged between 22 and 59 years, this time only suffering from a common cold. The final sample contains 225 observations. The authors use the same model to estimate the effects. Again the results imply that the demand curve for medical services is downward sloping. The estimated price elasticity for medical services varies between -0.23 and -0.36. The former elasticity is estimated with inclusion of OTC price information in the equation, but because of measurement issues, they estimated the price elasticity also without inclusion of OTC price information.

Both studies suggest that cost-sharing differences also matter for medical consumption for minor illnesses. On the basis of these studies, it is not possible to derive conclusions on the relative strength of price reactions for minor versus more serious illnesses, since these comparisons have not been made. Moreover one can even cast doubt on the validity of the results for minor illness, since neither study has taken the endogeneity of coinsurance into account.

Two other studies compare price responsiveness for different complaints. Both studies are already described in the paragraph on impact of cost-sharing on type of health care. Yoshida et al.[34] (2002) calculated price elasticities for outpatient medical care in Japan both before and after an increase in coinsurance rate of the family head. Their estimated elasticities for chronic diseases (e.g. asthma) are lower than those for temporary diagnoses (e.g. intestinal infections).

In the US, the earlier mentioned study of Dafny et al.[14] (2005) concentrates on the impact of expansions in access to public health insurance for low-income children on child hospitalizations. They also estimate an increase in hospitalization for unavoidable

conditions (8.1%) which is more than twice the increase for avoidable conditions (3.2%; insignificant). This suggests an efficiency effect of the expansions.

Impact of cost-sharing on prevention

Two studies analyze the impact of insurance on prevention comparing insured individuals with uninsured. Whereas in general the impact of insurance on consumption of medical care would be unambiguously positive because it lowers the price to the patient, this is not necessarily true for prevention. Insurance could induce 'ex ante moral hazard', reducing incentives to prevent a loss occurring[6]. Also in the case of prevention, a simple positive correlation between health insurance and prevention is no proof that health insurance causes people to obtain more prevention. Underlying factors, such as risk-aversion, can induce people to take out health insurance and consume preventive activities, therefore an instrumental variable approach is indicated.

Meer et al.[24] (2004) find that having insurance has a *positive effect* on the demand for preventive care. Insured people in the US are more likely to have a blood pressure check, cholesterol checks, a flu shot, a prostate exam, a breast exam, a mammogram and a pap smear compared to those without insurance. The effect of insurance is larger when controlling for endogeneity. The instruments used are three dummies for the individual's self-employed status (incorporated, sole-proprietor, and partnership). Other covariates are region, family size, age, age squared, gender race education and year effects. The results are robust for different specifications of the model.

Another research by Courbage et al.[13] (2004), looks at the impact of supplemental insurance on preventive actions in the UK using the British Household Panel Survey from 2000/2001 (cross-section). The results indicate that the impact is different for covered (by the national health insurance) versus non-covered preventive actions. More specifically, there is only a positive impact of supplemental insurance on prevention activities that are not covered (smoking and exercising). People tend to smoke significantly less and exercise significantly more when they have supplemental insurance. These differences seem to be larger when this supplemental insurance is bought at their own cost rather than at the cost of their employer. However, when estimated by an instrumental variable method, the effects are less clear. They use two sets of instruments: conservative (political) support and being employee, and, labour support and being employee. The instruments do not seem to be exogenous in the case of smoking. For sporting activities, the impact of insurance is still positive, but the significance depends on the chosen instrument. In order to study the impact of supplemental insurance on covered preventive actions, they look at breast screening and cervical smear. In the probit model, women undergo breast screening more often (just significant at 5% level) when having private insurance; the coefficient for cervical smear is not significant. Unfortunately, the authors did not estimate an IV model in this case. Moreover, these results are based on a cross-section, so one must question if this is still valid in a panel setting.

Impact of cost-sharing compared between groups in different health, minority groups and income categories

A few studies also examine whether insurance has a differential impact on certain groups within the population. Health status is a first variable used to define subgroups. The general idea is that people in bad health could respond differently to cost-sharing in comparison to people in good health. Remler et al.[25] (2002) examine this question. They estimate the response of Medicare beneficiaries to cost-sharing differences caused by differences in supplemental insurance for utilization of outpatient care. They estimate separately for groups in good and bad health with stratification into healthy and sick being performed in two different ways: on the basis of activity of daily living (ADL) impairment and on the basis of SAH. In general, Medicare requires a 20% coinsurance payment without any cap on OOP liability for outpatient care. Therefore, most beneficiaries have supplemental insurance. Both based on the stratification by ADL impairments and by health status, the results show that sick people are less responsive to supplemental insurance. As a consequence, the impact of supplemental insurance on

physician expenditures of Medicare beneficiaries is smaller for those with poorer health status (supplemental insurance increases expenditures by 12-18%) versus those in better health (increase of expenditures of 36%). Moreover, the difference in sensitivity is concentrated among the sickest, in the tails of the expenditure distribution. Remler et al.[25] (2002) further calculate a rough estimate of the bias that occurs in cost-estimates when heterogeneity is neglected: it is estimated to be about 2-7%. However, as these figures are calculated on a subsample of elderly persons (≥65 year) and as heterogeneity may be more marked in the non-elderly population, the results may not be generalized. The authors also remark that, as they only allow for two health status groups, they did not take into account within-group heterogeneity. Therefore, the estimate of heterogeneity should be interpreted as a lower bound. As in most studies, the authors do not control for endogeneity of supplemental insurance. This of course could bias the estimates. The authors did include health variables in the regression, which reduces some of the selection bias (observed selection). Leaving out these health variables leads to more selection bias. Since controlling for health status reduces the estimated cost-sharing sensitivity by more for the sick than for the healthy, the bias is conservative in the test of the hypothesis. This of course only under the assumption that unobserved selection differs by strata in the same way that observed selection differs.

Deb et al.[15] (2002) take a quite different approach to account for heterogeneous response of subgroups. They question the validity of the two-part model (TPM) to estimate demand for medical care[g] and instead suggest a latent class model (LCM) that distinguishes between frequent and infrequent users. In model comparisons using counts of contacts with a physician and counts of outpatient contacts with a physician or other health professional from the Rand HIE, they find strong evidence in favor of the LCM model. The focus of their article is on the choice of the econometric model and on differences in overall results, instead of differences between the two classes in their LCM model. The authors only investigate to which degree subsets of population parameters of the low- and high-use groups differ. Equality of parameter values is rejected for the subset of insurance variables (coinsurance rate, dummy for deductible, maximum dollar expenditure function, participation-incentive payment function) in the equation of physician utilization but not in the equation of outpatient physician and other health personnel utilization. Calculations of probabilities for hypothetical individuals on the basis of TPM and LCM differ substantively, especially in case of high-use probabilities. They find a larger price sensitivity at lower prices for both of the models. LCM elasticities are slightly higher at lower prices and lower at higher prices (compared to TPM).

Second, we found two studies in the US that investigate the impact of private health insurance for minorities. Thomas et al.[29] (2001) investigate the difference in the use of mental health services provided by an ambulatory medical care visit. They investigated whether private insurance is as effective in promoting outpatient mental health treatment as public coverage for ethnic minority groups on the basis of a two-stage least squares estimation with interaction terms for insurance status and minority. Their sample excludes the uninsured. After taking into account the endogeneity of insurance, they find that minorities with private health insurance use fewer mental health services than whites with private health insurance and than minorities with public health insurance. Whites with private or public insurance have a similar utilization pattern. Despite the use of a national sample with oversampling among minorities, only 3% of the adults used mental health services; for minorities there are only 67 mental health care users. Therefore, they could not include more than 7 predictors and rely on future research for a more fully specified equation.

A study of Hargraves et al.[17] (2003) looks at the differences in access of (general) care between Hispanics, African Americans and whites. One of the variables used to measure access is the proportion of individuals having no doctor visit in the past year. The authors further used regression based decomposition (i.e. Oaxaca-decomposition) to separate observed differences due to means (i.e. due to observable differences in

[g] The critique is for typical cross-sections data where consumption is analyzed per period of time and not per episode of illness.

explanatory variable values) and to coefficients (differences in the returns of the variables, what we are looking at in this section). Independent variables used are family income, dummy for health insurance, several community-level resources, personal characteristics, and a measure of general health status. Results show that observed differences in variable means, explain most of the differences in access: 88 % of the total difference between Whites and Hispanics and 76% between Whites and African Americans. Health insurance coverage was the most important single factor: explaining 40% of the difference between Whites and Hispanics and 80% between Whites and African Americans[h]. The impact of differences due to coefficients thus was small (respectively 12% and 24%) and was not further attributed to specific variables.

Third, there is one study, Meer et al.[24] (2004), that analyzes whether the impact of insurance is different for different income categories. They estimate a two-stage probit model for health services (see also sections on prevention and type of health care). In the equation, they include an interaction term between insurance and an indicator of whether or not the individual has a low income. The coefficients are not significant and therefore the authors conclude that the impact does not differ between income categories.

This contradicts the conclusion of Van de Voorde et al.[31] (2001) who do find a difference between persons with low-income versus the general population in Belgium (see higher).

Conclusion

From existing evidence, confirmed by new results, we can draw the general conclusion that there is clearly an impact of changes in cost-sharing on the probability of seeing a doctor (i.e. general practitioner or a specialist) and on the probability of having a hospital stay. Having insurance leads to a higher utilization of health services whereas an increase in cost-sharing leads to a decrease. More hard empirical conclusions however (on the basis of consistent findings from many different studies) cannot easily be found.

This is on the one hand due to the great variety in contextual factors: e.g. country and its health care system, year(s) of the data, size and exclusion of some subgroups… In addition there is a great variety in (measures of) independent and dependent variables. And there are the econometric aspects: (1) the estimation model which was used, (2) whether or not the study takes into account possible endogeneity of insurance, (3) the instruments that are used to solve this problem, together with their validity. Because each of the reviewed studies differs in one or more of these statements, it is rather impossible to draw general conclusions or compare the magnitude of the coefficients with each other. We limit ourselves to some striking (anecdotal) facts.

We see that price elasticities are different for different types of physicians. The demand for visits to general practitioners seems most affected by changes in cost-sharing for the patient. The Belgian studies seem to agree that GP home visits are most influenced by a changing cost-sharing. However, they do not agree on whether the demand for GP office visits or specialist visits is more price elastic. Furthermore, price elasticities differ by sex: the reaction of men seems more apparent than that of women. The price of health care is also an important factor influencing the degree of response: price elasticities seem larger for lower prices. The latter is based on the only study we found that uses Rand HIE data. Also, different subgroups respond in an other way to cost-sharing. For instance, sick individuals are less responsive to supplemental insurance than healthy people. Consistent with this is the fact that the price elasticity for chronic diseases is found to be smaller than that for temporary diagnoses, and that the elasticity for inpatient healthcare is lower than for outpatient health care.

We learn that the behaviour of physicians is also altered when the cost to the patient changes: they are more likely to prescribe generic pharmaceuticals in a reference price system than in a reimbursement system based on a fixed amount of deductible (based on only one study).

[h] This percentage is larger than the overall percentage explained due to differences in variable values, because other variables contributed negatively.

APPENDIX 3: DESCRIPTION OF EXPLANATORY VARIABLES

Variable	Description	Original variables
Preferential treatment		PP0030
preftreat	1 if preferential treatment for major risks	verhteg
Province		PP0025
Antwerpen	1 if Antwerpen [reference]	prov_01
Vl_Brab	1 if Vlaams-Brabant	prov_02
W_Vl	1 if West-Vlaanderen	prov_03
O_Vl	1 if Oost-Vlaanderen	prov_04
Limburg	1 if Limburg	prov_05
Brussels	1 if Brussels	prov_06
Brab_W	1 if Brabant Wallon	prov_07
Hainaut	1 if Hainaut	prov_08
Liège	1 if Liège	prov_09
Luxemb	1 if Luxembourg	prov_10
Namur	1 if Namur	prov_11
Age*Sex		PP0015 & PP0020
M_0	1 if Male and 0=<age<1	L0M
M_1-4	1 if Male and 1=<age<5	L1_5M
M_5-9	1 if Male and 5=<age<10	L5_10M
M_10-14	1 if Male and 10<=age<15	L10_15M
M_15-19	1 if Male and 15<=age<20	L15_20M
M_20-24	1 if Male and 20<=age<25	L20_25M
M_25-29	1 if Male and 25<=age<30	L25_30M
M_30-34	1 if Male and 30<=age<35 [reference]	L30_35M
M_35-39	1 if Male and 35<=age<40	L35_40M
M_40-44	1 if Male and 40<=age<45	L40_45M
M_45-49	1 if Male and 45<=age<50	L45_50M
M_50-54	1 if Male and 50<=age<55	L50_55M
M_55-59	1 if Male and 55<=age<60	L55_60M
M_60-64	1 if Male and 60<=age<65	L60_65M
M_65-69	1 if Male and 65<=age<70	L65_70M
M_70-74	1 if Male and 70<=age<75	L70_75M
M_75-79	1 if Male and 75<=age<80	L75_80M
M_80-84	1 if Male and 80<=age<85	L80_85M
M_85-89	1 if Male and 85<=age<90	L85_90M
M_90-94	1 if Male and 90<=age<95	L90_95M
M_95+	1 if Male and 95<=age	L95M

Variable	Description	Original variables
F_0	1 if Female and 0=<age<1	L0V
F_1-4	1 if Female and 1=<age<5	L1_5V
F_5-9	1 if Female and 5=<age<10	L5_10V
F_10-14	1 if Female and 10<=age<15	L10_15V
F_15-19	1 if Female and 15<=age<20	L15_20V
F_20-24	1 if Female and 20<=age<25	L20_25V
F_25-29	1 if Female and 25<=age<30	L25_30V
F_30-34	1 if Female and 30<=age<35	L30_35V
F_35-39	1 if Female and 35<=age<40	L35_40V
F_40-44	1 if Female and 40<=age<45	L40_45V
F_45-49	1 if Female and 45<=age<50	L45_50V
F_50-54	1 if Female and 50<=age<55	L50_55V
F_55-59	1 if Female and 55<=age<60	L55_60V
F_60-64	1 if Female and 60<=age<65	L60_65V
F_65-69	1 if Female and 65<=age<70	L65_70V
F_70-74	1 if Female and 70<=age<75	L70_75V
F_75-79	1 if Female and 75<=age<80	L75_80V
F_80-84	1 if Female and 80<=age<85	L80_85V
F_85-89	1 if Female and 85<=age<90	L85_90V
F_90-94	1 if Female and 90<=age<95	L90_95V
F_95+	1 if Female and 95<=age	L95V
Died		PP0040B
died_q1	1 if person died in 1st quarter	PP0040B_kw1
died_q2	1 if person died in 2nd quarter	PP0040B_kw2
died_q3	1 if person died in 3rd quarter	PP0040B_kw3
died_q4	1 if person died in 4th quarter	PP0040B_kw4
Social Statute		PP0030 & PP0035
res_not lowY	1 if resident and no low income*	KG1_00_10080
res_lowY	1 if resident and low income*	KG1_00_10081
employee	1 if active employee [reference]	KG1_01
inval_tit	1 if invalid and titular	KG1_02tit
inval_dep	1 if invalid and dependent	KG1_02ptl
handic_tit	1 if handicapped and titular	KG1_mindervtit
handic_dep	1 if handicapped and dependent	KG1_mindervptl
retired	1 if retired	KG1_03
widow	1 if widow/widower	KG1_04
orphan	1 if orphan	KG1_05

Variable	Description	Original variables
self_empl	1 if self employed with entitlement to reimbursement of small risks in compulsory system	ZR_metKR
Employment Status		PP1004
empl&not work	1 if employee or not working [reference]	PP1004_rest
unemployed	1 if unemployed	PP1004_werkloos
parttime	1 if employed part-time	PP1004_deeltijds
early_retired	1 if early retirement	PP1004_brug
Lump sums		
nursing_pay_B	1 if lump sum B nursing care (chronic illness) forfait B verpleegkundige zorgen	PP2001
nursing_pay_C	1 if lump sum C nursing care (chronic illness) forfait C verpleegkundige zorgen	PP2002
phys_E	1 if physiotherapy E or physiotherapy kinesitherapie E of fysiotherapie	PP2003
incr_child_ben	1 if increased child benefit verhoogde kinderbijslagen	PP2004
integr_handic	1 if allowance integration handicapped (cat III or IV) toelage voor de integratie van gehandicapten (cat III of IV)	PP2005
help_elderly	1 if allowance help to elderly (cat III, IV or V) toelage voor hulp aan ouderen (cat III, IV of V)	PP2006
help_thirdparty	1 if remittance help third party uitkering hulp aan derden	PP2007
ben_invalidity	1 if allowance for primary incapacity or disablement benefit uitkering voor primaire arbeidsongeschiktheid of invaliditeitsuitkering	PP2008
lumpsum_thirdparty	1 if fixed lump sum to third party forfaitaire uitkering hulp aan derden	PP2009
guarant_Y_-60	1 if entitlement to guaranteed minimum income, guaranteed income for elderly or subsistence income and age<60 recht op gewaarborgd inkomen, inkomensgarantie voor oudere of op het leefloon	PP3010_3013_tot60
guarant_Y_+60	idem but age>=60	PP3010_3013_va60
subsidy_handic	1 if entitlement to subsidies for handicapped people recht op toelage van gehandicapten	PP3011
ben_unempl	1 if more than 6 months unemployment benefit meer dan 6 maanden werkloosheidsuitkering	PP3012
work_incap	1 if at least 1 day of work incapacity tenminste 1 dag arbeidsongeschikt	PP4002_d
Room type		
room_1p	1 if single room	C1
room_2p	1 if two-person room	C2
room_+2p	1 if common room	Cc
room_un	1 if room type unknown	o
Hospital characteristics		
hosp_chron	1 if chronic hospital	CZ

Variable	Description	Original variables
hosp_psych	1 if psychiatric hospital	PZ
hosp_acute	1 if acute hospital [reference]	AZ
bed_-250	1 if hospital with ≤250 beds	m250
bed_250-500	1 if hospital > 250 beds but ≤ 500 beds [reference]	250_500
bed_+500	1 if hospital with > 500 beds	500m
hosp_priv	1 if private hospital	priv
hosp_publ	1 if public hospital [reference]	pub

* low income defined as: persons having an allowance equal to the guaranteed minimum income or comparable benefit; individuals having a revenue ≤ 12 times the subsistence income of the head of the family; individuals paying a full contribution; persons with annual taxable gross income <1,000,000 BEF (approx €25,000); individuals with income < than limit for Widows Disabled Retired and Orphans.

Variable	Description
Medical expenditures aggregation categories**	
drugs_a	Drugs categories A, B, C, Cs and Cx and other reimbursed pharmacy items in ambulatory setting
GP_a	GP services in ambulatory setting
special_a	Consultations of a specialist internal medicine, neurology, psychiatry, neuro-psychiatry, paediatrician, cardiologist, psychotherapies and technical interventions in ambulatory setting
physspec_a	Consultations of other physician specialists in ambulatory setting
surgery_a	Surgical interventions in ambulatory setting
physioth_a	Services of a physiotherapist in ambulatory setting
paramedical_a	Other paramedical services in ambulatory setting
dental_a	Dental treatment in ambulatory setting
clinical_a	Analysis clinical biology in ambulatory setting
other_a	Other reimbursed services in ambulatory setting
medical fee_h	Medical fees of inpatients (except surgical and gynaecological)
surgical fee_h	Surgical fees of inpatients
physio fee_h	Fees of physiotherapists of inpatients
gynaec fee_h	Gynaecological fees of inpatients
radio fee_h	Radiological fees
drugs_h	Drugs (all categories) and other reimbursed pharmacy items of inpatients
impl28_h	Implants article 128
impl35_h	Implants article 35
impl35bis_h	Implants article 35bis
implnon-reimb_h	Non-reimbursed Implants
delivery impl_h	(Pharmacist) delivery charges for implants
nursing day_h	Nursing day price exclusive non-medical 'luxury' items such as phone, television, safe..

Variable	Description
divcost_h	Diverse costs (i.e. non-medical 'luxury' items)
paramedical_h	Non-reimbursed paramedical items of inpatients
clinical fee_h	Fees clinical biology of inpatients
other_h	Other inpatient treatments
Paramedical professions - details	
nursing_a	Nursing fees in ambulatory setting
midwife_a	Midwife fees in ambulatory setting
bandager_a	Bandager fees in ambulatory setting
soles_a	Orthopaedic soles bandagers and orthopaedics in ambulatory setting
orthoped_a	Orthopaedics fees in ambulatory setting
optician_a	Optician fees in ambulatory setting
audiol_a	Audiologist fees in ambulatory setting
logo_ortho_a	Logopaedic and orthopaedic treatment in ambulatory setting

** a more detailed description of the medical care categories is given in appendix 1.

APPENDIX 4: DISTRIBUTION OF SOCIO-ECONOMIC CHARACTERISTICS FOR INDIVIDUALS WITH PREFERENTIAL TREATMENT AND WITHOUT PREFERENTIAL TREATMENT (%)

	preftreat	
	0	1
Antwerpen	16.62	14.25
Vl_Brab	10.45	6.84
W_Vl	10.65	11.45
O_Vl	13.54	12.34
Limburg	7.74	7.46
Brussels	8.7	12.75
Brab_W	3.6	2.11
Hainaut	12.42	14.97
Liège	9.91	11.52
Luxemb	1.87	2
Namur	4.5	4.3
M_0	0.6	0.28
M_1-4	2.52	1.1
M_5-9	3.03	1.55
M_10-14	3.21	2.01
M_15-19	3.17	2.51
M_20-24	3.35	1.77
M_25-29	3.45	1.11
M_30-34	3.73	1.36
M_35-39	3.87	1.49
M_40-44	3.91	1.54
M_45-49	3.67	1.51
M_50-54	3.3	2.43
M_55-59	2.97	2.81
M_60-64	2.16	3.15
M_65-69	2.11	3.7
M_70-74	1.83	3.94
M_75-79	1.32	3.49
M_80-84	0.79	2.55
M_85-89	0.2	1.06
M_90-94	0.07	0.52
M_95+	0.01	0.11
F_0	0.58	0.24
F_1-4	2.41	0.84

	preftreat	
	0	1
F_5-9	2.94	1.25
F_10-14	3.1	1.7
F_15-19	3	2.27
F_20-24	3.37	1.83
F_25-29	3.59	0.95
F_30-34	3.86	1.25
F_35-39	4.01	1.65
F_40-44	4.12	1.97
F_45-49	3.81	2.47
F_50-54	3.31	3.36
F_55-59	2.96	4.1
F_60-64	2.21	4.35
F_65-69	2.2	5.6
F_70-74	1.99	6.77
F_75-79	1.57	7.09
F_80-84	1.09	6.29
F_85-89	0.37	3.23
F_90-94	0.18	2.15
F_95+	0.04	0.65
died_q1	0.11	0.46
died_q2	0.16	0.88
died_q3	0.15	0.88
died_q4	0.18	0.9
employee	79.62	16.14
res_not lowY	0.22	3.85
res_lowY	0.66	10.32
inval_tit	1.36	7.39
inval_dep	0.51	4.89
handic_tit	0.09	7
handic_dep	0.04	1.09
retired	14.89	33.47
widow	2.61	15.63
orphan	< 0.00	0.23
self_empl	0.84	4.94
empl&not work	91.11	93.32
unemployed	7.12	5.78
parttime	0.61	0.11
early_retired	1.16	0.79

	preftreat	
	0	1
nursing_pay_B	0.14	1.29
nursing_pay_C	0.06	0.61
phys_E	0.76	4.07
incr_child_ben	0.05	1.61
integr_handic	0.13	5.15
help_elderly	0.28	6.03
help_thirdparty	< 0.00	0.71
ben_invalidity	0.04	0.43
lumpsum_thirdparty	0.01	0.19
guarant_Y_-60	0.36	6.93
guarant_Y_+60	0.04	7.59
subsidy_handic	0.12	17.78
ben_unempl	3.78	5.87
work_incap	3.87	1.33

APPENDIX 5: APPENDIX TO CHAPTER 3

This appendix contains three parts. We first describe some characteristics of the Health Interview Survey. We then present in some detail the independent variables used in the estimation exercise of Table 30 of chapter 3 and the variables which have been used for the imputation of supplemental insurance in the IMA-data.

Supplemental hospital insurance in the Health Interview Survey 2001

The HIS[i] is a Belgian health survey that was collected by the Scientific Institute of Public Health as a set of repeated cross sections in 1997, 2001 – the most recent version available at the time of the analysis – and 2004. Its main objective is to provide information on health status, lifestyle and utilization of preventive and health care services of the Belgian population, in combination with socio-economic characteristics. This information is obtained through three questionnaires, i.e. an oral questionnaire per household (e.g. composition of the household, household income, health care expenditures, etc.), an oral questionnaire for individuals[j] (e.g. medical consumption, diseases, limitations, individual income, occupation, etc.), and a written questionnaire to be completed by individuals older than 15 years (e.g. complaints, social contacts, prevention, etc.). The households (and individuals) are questioned throughout the year to avoid systematic seasonal variation.

The HIS 2001 is intended to cover the population that is registered in the National Register such that there are no restrictions on nationality and age. It also includes elderly living in institutions and (religious) communities up to 8 persons, but excludes collective communities (e.g. prisons and large religious communities) and households in which nobody speaks Dutch, French or German. The final sample is the result of combining several sampling techniques. First, the total sample size was set to contain at least 12,050 persons. Second, there is regional and provincial stratification[k]. Third, primary sampling units – municipalities – are selected within each province[l] and within each municipality secondary sampling units – households – are drawn using a cluster method. The latter method corrects for systematic drop-outs (e.g. refusal to participate, not eligible, impossible to locate, etc.), if any[m]. Finally, tertiary sampling units – the individuals – are chosen. No more than 4 members are interviewed within each household[n].

Due to the complex multistage probability sampling design, the final dataset is unlikely to be representative. Therefore, sampling weights on the individual are provided that should be applied while analyzing the data. All summary statistics (except in Table 1 below) and data analyses in this report use normalized sampling weights. Normalized sampling weights imply that weights of missing observations are neglected and that the remaining weights are normalized such that they have an average of one.

---

[i] More information on the HIS and the included variables in the HIS 2001 can be found on Volksgezondheid[35] and in Demarest et al.[36] (2001).

[j] The oral questionnaire is answered by a proxy if the individual (i) is under 15 years of age, (ii) is too sick or with mental disabilities, (iii) cannot be reached for an extended period or (iv) refused to answer, but did not refuse that a proxy answers.

[k] Regional stratification is implemented as 4,050 individuals in Flanders, 5,000 in the Walloons and 3,000 in Brussels, and provincial stratification implies that the number of interviews has to be proportional to population size, with a minimum of 50 interviews. In addition, there is an oversampling of the German Community, and of the provinces of Antwerpen, Limburg, Luxembourg and Hainaut.

[l] Selection chance of each primary sampling unit is proportional to its population size and 50 individuals are interviewed in each selected primary sampling unit.

[m] A cluster of households consists of 4 households, i.e. the selected household and 3 replacements. The households within a cluster are matched based on the statistical sector within a municipality, the size of the household and the age of the reference person.

[n] The reference person and his/her partner are always interviewed in households with more than 4 members. The others are randomly selected using a birthday rule.

Table 1 gives some frequencies of supplemental hospital insurance[o] in the total sample and in the estimation sample. From the frequencies for the total sample, it can be seen that 71.53 percent answered yes or no. Within this sub-sample, 60.84 percent (=43.52/71.53) claim to have supplemental hospital insurance[p]. The remainder of the total sample consists of three small categories – no answer, don't know, error interviewer – and a larger one – not applicable. The latter respondents - consisting of those still going to school – have not been questioned on supplemental hospital insurance. This omission is unlikely to lead to biases in the analysis of the determinants of supplemental hospital insurance, since individuals still going to school are in most instances insured through their parents.

Table 1: Frequencies of supplemental hospital insurance in HIS 2001

	Total sample	Estimation sample
Yes	5,271 (43.52%)	3,990 (62.36%)
No	3,392 (28.01%)	2,408 (37.64%)
No answer	95 (0.78%)	
Don't know	84 (0.69%)	
Not applicable	3,201 (26.43%)	
Error interviewer	70 (0.58%)	
Total	12,111 (100%)	6,398

Sampling weights were used to construct the frequencies in the left column. In the right column, we have used normalized sampling weights.

We estimate in chapter 3 models on the determinants of supplemental hospital insurance on the 'yes'- 'no'-categories only. In doing so, we lost additional observations due to item-non-response in the independent variables. Despite losing more than 2000 observations, the share of individuals with supplemental hospital insurance (62.36%) hardly deviates from that on the total sample. Although this (reassuringly) suggests exogenous sample selection, we further analyzed differences – if any – in the characteristics of those individuals answering yes-no in the total and estimation sample. Based on cross-tabulations and Spearman's correlation coefficients, we find some significant – but quantitatively small – differences in the composition of both samples. We conclude that confining attention to the estimation sample instead of the total sample is unlikely to affect the results.

Independent variables to estimate determinants of supplemental hospital insurance

This appendix is subdivided in two subsections. The first discusses all independent variables, except those on health which are covered in the second subsection[q]. Throughout the entire appendix, we give summary statistics of the independent variables for the estimation sample only. For categorical variables we indicated the reference category with an asterisk.

[o] The information was obtained in the oral part of the survey. In this part of the survey, a proxy may be accepted to answer the question if the individual did not.

[p] There is little scope to cross-validate this percentage in Belgium due to data deficiencies. Berghman et al.[37] (2005) have summarized the existing evidence, but did not report figures that are comparable to the HIS 2001, i.e. a combination of private- and employer provided insurance. Recently, Van de Voorde[38] (2005) has reported a share of 73% for the 50+ based on a preliminary version of the Belgian SHARE dataset. The corresponding number for the 50+ in the HIS 2001 amounts to 58.82%.

[q] The survey also informs on health care consumption but that information was not considered due to possible endogeneity. For the same reason, we did not consider the information on a regular GP since it clearly reflects individual choices.

Demographic, socio-economic, geographical and insurance variables

For purely illustrative purposes, we have categorised the independent variables (except for the health variables) into four categories. Summary statistics for the first group of demographic variables (sex, age, family type, nationality) are given in Table 2. With respect to the construction of the dummies on family type, the HIS defines children as household members which are 18 years or younger. A complex household was defined as a household which cannot be attributed to one of the other 4 groups (e.g. 3 adults or more).

In Table 3, we present summary statistics of the socioeconomic variables. First, we include monthly disposable household income[r] in Belgian Francs (1 €= 40.3399 BEF) corrected for family structure, i.e. equivalent household income ('eqinc')[s]. Next, we categorized this variable into a set of 6 income ranges in order to allow for a flexible functional form. Second, education is reflected by five dummies on the highest degree ever obtained. For individuals that are in the course of studying a degree, we replaced missing values – if any – with the degree needed to be admitted to their studies. Other individuals gave specific answers to the highest degree obtained (e.g. bacalaureat, doctorat, A1,…). We classified these answers – where possible – in one of the four dummies. The individuals that could not be classified are included in the category 'otherdipl'. Third, occupation is measured with a set of 6 dummies. These are constructed from 5 variables in the HIS 2001[t]. Fourth, we have 5 dummies reflecting lifestyle, i.e. weekly sporting, current smoking and alcohol consumption during the past year.

Table 4 presents summary statistics on the geographical variables. First, we have information on the three regions (Flanders, Brussels and the Walloons). Second, there is information at the level of the provinces.

The HIS also indicates whether an individual qualifies for lower co-payments due to preferential treatment. This is true for 12.3% of the estimation sample.

[r] Household income includes (i) net labour income (main and secondary occupation), (ii) net profit for self-employed, (iii) social allowances (e.g. child allowance, unemployment, pension, disability, invalidity, accident payment, minimum income protection), and (iv) additional income sources (rental income, annuities,…). In 85% of the estimation sample, it is recorded as a continuous number. The other 15% is recorded in categories. Using the total sample, we replaced the categories with averages per category, calculated from the continuous measure.

[s] We used the modified OECD scale that weighs the first individual with 1, subsequent individuals with 0.5 and children (defined as 13 or younger) with 0.3.

[t] The 5 original questions in the HIS 2001 are:

- current work station: (1) paid work, (2) interrupted paid work, (3) no paid work.
- classification paid work: (1) blue-collar, white collar, civil servant, (2) small self-employed (max. 5 employees), (3) farmer, (4) professional, (5) CEO (min. 6 employees), (6) wholesale dealer, (7) other category.
- classification no paid work: (1) retired (including early retirement), (2) sickness and disability, (3) unemployed, (4) student, (5) housework, without allowance, (6) other category.
- ever had paid work: yes/no.
- classification last work: (1) blue-collar, white collar, civil servant, (2) small self-employed (max. 5 employees), (3) farmer, (4) professional, (5) CEO (min. 6 employees), (6) wholesale dealer, (7) other category.

Table 2: Summary statistics of demographic variables in HIS 2001

Variable	Description	Obs	Mean	Stdev
sex	1 for male, 0 for female	6,398	0.490	0.500
age 15-19	15 <= age <= 19	6,398	0.005	0.069
age 20-24	20 <= age <= 24	6,398	0.049	0.216
age 25-29	25 <= age <= 29	6,398	0.082	0.274
age 30-34	30 <= age <= 34	6,398	0.103	0.304
age 35-39	35 <= age <= 39	6,398	0.116	0.321
age 40-44	40 <= age <= 44 [*]	6,398	0.108	0.310
age 45-49	45 <= age <= 49	6,398	0.102	0.302
age 50-54	50 <= age <= 54	6,398	0.094	0.292
age 55-59	55 <= age <= 59	6,398	0.069	0.254
age 60-64	60 <= age <= 64	6,398	0.067	0.251
age 65-69	65 <= age <= 69	6,398	0.067	0.251
age 70-74	70 <= age <= 74	6,398	0.055	0.228
age 75-79	75 <= age <= 79	6,398	0.047	0.211
age: 80-84	80 <= age <= 84	6,398	0.020	0.141
age: 85+	85 <= age	6,398	0.015	0.123
single	1 if single without children, 0 otherwise	6,398	0.178	0.382
single_child	idem for single with children	6,398	0.033	0.177
couple	idem for couple without children	6,398	0.329	0.470
couple_child	Idem for couple with children [*]	6,398	0.296	0.456
complex	Idem for complex household	6,398	0.165	0.371
Belgian	1 for Belgian, 0 otherwise [*]	6,398	0.938	0.241
EUmember	Idem for non-Belgian EU member	6,398	0.046	0.209
nonEU	Idem for non-Belgian non-EU member	6,398	0.016	0.125

Normalized sampling weights were used.

Table 3: Summary statistics of socio-economic variables in HIS 2001

Variable	Description	Obs	Mean	Stdev
eqinc: 0-20	0 BEF<=eqinc<20.0000 BEF	6,398	0.037	0.190
eqinc: 20-40	20.000 BEF<=eqinc<40.0000 BEF [*]	6,398	0.388	0.487
eqinc: 40-60	40.000 BEF<=eqinc<60.0000 BEF	6,398	0.360	0.480
eqinc: 60-80	60.000 BEF<=eqinc<80.0000 BEF	6,398	0.159	0.366
eqinc: 80-100	80.000 BEF<=eqinc<100.0000 BEF	6,398	0.036	0.187
eqinc: 100+	100.000 BEF<=eqinc	6,398	0.019	0.137
no_primary	1 if no or primary school, 0 otherwise	6,398	0.183	0.386
secondary	1 if secondary school, 0 otherwise [*]	6,398	0.525	0.499
higher	1 if higher education, 0 otherwise	6,398	0.203	0.402
university	1 if university, 0 otherwise	6,398	0.075	0.264
otherdipl	1 if other diploma, 0 otherwise	6,398	0.014	0.116
employee	blue/white collar, civil servant, paid work=other, interrupted paid work without providing last work category [*]	6,398	0.497	0.500
self-employed	small self-employed, farmer, professional, CEO, wholesale dealer	6,398	0.066	0.248
retired	(early) pensioned	6,398	0.254	0.435
sick	disabled or invalid	6,398	0.028	0.165
unemployed	unemployed	6,398	0.063	0.242
other not working	housework, student, not working	6,398	0.093	0.290
sport	1 if practising sport, 0 otherwise	6,398	0.659	0.474
smoke_dai	1 if daily smoking, 0 otherwise	6,398	0.254	0.436
smoke_occ	1 if smokes occasionally, 0 otherwise	6,398	0.042	0.202
smokerno	1 if not smoking, 0 otherwise [*]	6,398	0.703	0.457
alcohol	1 if drinking alcohol, 0 otherwise	6,398	0.819	0.385

Normalized sampling weights were used.

Table 4: Summary statistics of geographical variables in HIS 2001

Variable	Description	Obs	Mean	Stdev
Flanders	1 if living in Flanders, 0 otherwise [*]	6,398	0.579	0.494
Brussels	1 if living in Brussels, 0 otherwise	6,398	0.095	0.294
Walloons	1 if living in the Walloons, 0 otherwise	6,398	0.326	0.469
provantwerp	1 if province of Antwerpen, 0 otherwise [*]	6,398	0.163	0.369
provvlbrabant	idem for province of Vlaams Brabant	6,398	0.098	0.298
provwestvl	idem for province of West Vlaanderen	6,398	0.107	0.310
provoostvl	idem for province of Oost Vlaanderen	6,398	0.138	0.345
provlimburg	idem for province of Limburg	6,398	0.073	0.260
provbrussel	idem for province of Brussel	6,398	0.095	0.294
provbrabantw	idem for province of Brabant Wallonne	6,398	0.029	0.167
provhainaut	idem for province of Hainaut	6,398	0.126	0.332
provliège	idem for province of Liège	6,398	0.106	0.308
provluxemb	idem for province of Luxembourg	6,398	0.025	0.155
provnamur	idem for province of Namur	6,398	0.041	0.197

Normalized sampling weights were used.

Health variables

There are about 100 questions on health status. As it is impossible to consider all questions in our analysis, we decided to delete questions related to short-term limitations (i.e. the original questions IC01-IC06) and 2 modules with questions on limitations in physical functioning (i.e. the original questions IL11-IL26)[u]. We omitted these questions as there was no straightforward way of summarizing the information. All other health questions were considered for the analysis, i.e. some questions are used directly and some questions are combined into single indicators. First, we use self-assessed health (measured on a five point scale) and a dummy indicating whether the individual suffers from a chronic illness or is handicapped. Second, we have information on length and weight which enables us to calculate the body mass index. We construct four regions of the body mass index (see e.g. Garrow[39] (1990)); an index between 18 and 25 indicates regular weight, while (>=25) <18 indicate (over-) underweight, and >=30 indicates obesity. Third, the survey includes two 'constructed' health indicators. The first – GHQ12 – aggregates information revealed through 12 questions on general well-being into one index[v]. Higher values of the index correspond to more severe states of well-being. The second 'constructed index – SF-36 physical functioning score – is based on 10 questions and captures physical functioning with higher values corresponding to better physical functioning (see www.sf-36.org and Demarest et al.[36] (2001) for explanation on the calculation of the scores). The questions on the other SF-36 domains where not included in the survey. Fourth, we have information on specific chronic and acute diseases. Instead of including separate dummies for each of the 3 acute and 38 chronic diseases, we included two dummy variables measuring the presence of at least one acute and one chronic disease. Finally, we have 42 questions on health complaints during the last week; e.g. having had a headache, problems to breath,

[u] We believe the omission of both modules hardly reduces the information content of our health variables, as we did not omit a third module on limitations in physical functioning (SF-36 physical functioning score).

[v] The GHQ12 score is obtained from two steps. First, the answers on each of the 12 questions are transformed into a binary variable, with 1 reflecting worse and 0 better well-being. Second, one takes the sum of the 12 binary variables (see e.g. Goldberg et al.[40] (1997)).

having unpleasant thoughts, pain in chest, etc. Each question has 5 categories, ranging from 'no problems at all' to 'many problems'. These questions are a subset of the 90 questions of the "Symptom Checklist-90-Revised" which is trademarked by LR Derogatis at Pearson assessments[41] and which has been used to evaluate psychological problems in the medical literature (see e.g. Deragotis et al.[42] (1981)). The HIS 2001 has not applied the scoring method of Derogatis to summarize the 90 questions into 9 subscales since it seems to lead to invalid results[36]. Instead, the HIS 2001 only includes the 42 questions for which no problems where encountered. The HIS 2001 proposes some ad hoc summaries of these 42 questions. Instead, we decided to reduce the number of dimensions from 42 to 2 using factor analysis[w]. The first factor measures mood, while the second is an indicator of pain, with higher values indicating worse mood/pain[x]. Summary statistics of the health variables are shown in Table 5.

Table 5: Summary statistics of health variables in HIS 2001

Variable	Description	Obs	Mean	Std Dev
sahverygood	1 if SAH very good, 0 otherwise	6,398	0.224	0.417
sahgood	1 if SAH good, 0 otherwise [*]	6,398	0.522	0.500
sahfair	1 if SAH fair, 0 otherwise	6,398	0.212	0.409
sahpoor	1 if SAH poor, 0 otherwise	6,398	0.038	0.191
sahverypoor	1 if SAH very poor, 0 otherwise	6,398	0.005	0.071
bmi_018	body mass index<18	6,398	0.019	0.138
bmi_1825	18<=body mass index<18 [*]	6,398	0.515	0.500
bmi_2530	25<=body mass index<18	6,398	0.338	0.473
bmi_30+	30<=body mass index	6,398	0.128	0.334
chronic	1 if chronic or handicap, 0 otherwise	6,398	0.307	0.461
GHQ12	GHQ-12 score	6,398	1.290	2.399
SF36	SF-36 score	6,398	85.908	24.049
acute	at least one acute disease	6,398	0.091	0.287
chron	at least one chronic disease	6,398	0.657	0.475
compl_f1	complaints, measuring mood	6,398	1.298	0.509
compl_f2	complaints, measuring pain	6,398	1.541	0.695

Normalized sampling weights were used.

[w] We did not apply factor analysis to the other health variables (SAH, chronic, BMI, GHQ12, SF36 physical functioning, acute, chron) for three reasons. First, self-assessed health, the dummy on chronic illnesses, and the body mass index have a clear interpretation. The properties of the 'constructed' indices GHQ12 and SF36 physical functioning score are well known (e.g. Goldberg et al.[40] (1997); www.sf-36.org), and summarizing the questions on acute and chronic illnesses into two dummy variables has some intuitive appeal. Second, factor analysis was developed for continuous variables, but a rule of thumb prescribes that the method works reasonably well for variables with at least five categories (see e.g. Johnson et al. [43] (2002)). Obviously, this does not hold for some of the health variables used in this chapter. Third, the correlation between the health variables is generally low, i.e. we observe only one correlation that is higher than 0.40.

[x] The "mood" factor captures the following variables: unpleasant thoughts, reflecting on suicide, easily crying, feeling captive, afraid without reason, blaming oneself, feeling lonely, feel down, worrying too much, losing interest, feel afraid, feelings of emptiness, future without hope, being nervous, thinking of death, attacks of fear, being restless, lethargy, horrible future, and fearful thoughts. The "pain" factor combines lower back pain, painful muscles, stunned feeling, feeling sleepy, and heavy feeling in arms and legs.

Variables used for the imputation exercise

For the imputation procedure, we set up a list of variables that appeared in both IMA and HIS 2001. Table 6 gives the raw variables in the HIS 2001 and their counterparts in IMA data that are relevant and available for analysing the determinants of supplemental hospital insurance.

There are two relevant differences in content between the raw variables in HIS 2001 and IMA. First, age is defined as the date of the interview minus the date of birth in the HIS 2001, while only the year of birth is available in IMA (PP0015). We therefore use the year of the IMA survey minus the year of birth as a proxy for age in the imputation procedure. The use of this proxy is unlikely to lead to biases since we work for age with intervals of five years. Second, although both the HIS 2001 and IMA have information at the level of districts, we decided to stick to the more aggregate level of provinces as the cell sizes of some districts are too low in the HIS 2001. In IMA, one further observes an additional category, i.e. 'abroad or not known'. This category does not exist in the HIS 2001.

Table 6 only presents the raw variables. The variables in the HIS 2001 that are actually used, are presented in Tables 7-11. In case the construction of the variables is similar to that in the previous section of this appendix, we only present summary statistics. Any other differences are explained alongside Tables 7-11.

The construction differs for the occupational variables. Based on the same original HIS variables, we construct 9 dummies (see Table 9). Three dummies ('em', 'sel', 'nw') are identical to those used before (i.e. 'employee', 'self-employed', 'other not working'), but we make additional subcategories in the categories for retired, sick & disabled and unemployed.

In Table 11, we present summary statistics of variables related to health insurance in the HIS 2001. We have 2 sets of indicators in the HIS 2001[y]. First, we know whether an individual is eligible for reduced co-payments ('preftreat'). Second, the reason for this eligibility is known ('wdro' and 'elderly'). There are additional reasons for eligibility in the HIS (i.e. ex-colonial, monks and nuns, non-protected persons, entitled to increased child benefit for handicapped children, allowance integration handicapped, and long-term unemployed), but due to small cell sizes these were neglected. Moreover, in practice and in IMA individuals may qualify for more than one of these categories, whereas individuals fall only into one category in HIS.

[y] We decided not to use information in the HIS 2001 on whether self-employed are insured against small risks since this variable suffers from considerable misreporting. We neither used information on whether individuals have a regular GP or a regular centre of GP's because of misreporting, i.e. 95% claim to have a regular GP or a regular centre of GP's in the HIS while only 35% has a 'global medical file' ('globaal medisch dossier', 'dossier medical global') according to IMA data. Finally, we experimented with an indicator that measures whether all household members are insured with the same sickness fund since this information is available in IMA data. However, as this variable turned out statistically insignificant and we are only interested here in a predictive – rather than descriptive – exercise, we decided to exclude this variable.

Table 6: Comparison of variables in HIS 2001 and IMA

HIS 2001 variable code	Description	IMA variable code	Description
HC04	Sex	PP0020	Sex
AGE5Y	age-categories (5y)	PP0015	year of birth
IN08	reduced co-payments	PP0030	KG1
IN09	eligibility IN08 due to…	PP0030	KG1
IN09=1	WDRO[z]	PP3010	'recht op een gewaarborgd inkomen, inkomensgarantie voor ouderen of op het leefloon, recht op hulp van OCMW'
IN09=4	'rechthebbenden op gewaarborgd inkomen voor bejaarden'		
IN09=6	'bestaansminimumtrekkers of steuntrekkers van het OCMW'	PP3013	
EM01	current work status is…		sociale toestand op datum van het model E
EM01=1	paid work		
EM01=2	interrupted paid work	PP1003	
EM01=3	no paid work		code werkloosheid
EM03	classification paid work		
EM03=1	blue-collar, white collar, civil servant	PP1004	
EM03=2	small self-employed (max. 5 employees)		KG1
EM03=3	farmer	PP0030	'aantal dagen arbeidsongeschiktheid'
EM03=4	professional		
EM03=5	CEO (min. 6 employees)	PP4002	titularis/persoon ten laste
EM03=6	wholesale dealer		
EM03=7	other category		
EM09	classification no paid work	PP1002	
EM09=1	retired (including early retirement)		
EM09=2	sickness and disability		
EM09=3	unemployed		
EM09=4	student		
EM09=5	housework, without allowance		
EM09=6	other category		
EM10	Ever had paid work?		
EM12	classification last work		
EM12=1-7	same as EM03		

[z] W(idower), D(isabled), R(etired), O(rphans) is the translation of "WIGW/VIPO".

Table 7: frequencies of supplemental supplemental hospital insurance for imputation

	Total sample	Estimation sample
Yes	5,271 (43.52%)	5,295 (61.09%)
No	3,392 (28.01%)	3,372 (38.91%)
No answer	95 (0.78%)	
Don't know	84 (0.69%)	
Not applicable	3,201 (26.43%)	
Error interviewer	70 (0.58%)	
Total	12,111 (100%)	8,667 (100%)

Sampling weights were used to construct the frequencies in the left column. In the right column, we have used normalized sampling weights.

Table 8: summary statistics of age and sex for imputation

Variable	Description	Obs	Mean	Stdev
sex	1 for male, 0 for female	8,667	0.486	0.500
age 15-19	15 <= age <= 19	8,667	0.006	0.079
age 20-24	20 <= age <= 24	8,667	0.049	0.215
age 25-29	25 <= age <= 29	8,667	0.080	0.271
age 30-34	30 <= age <= 34	8,667	0.102	0.302
age 35-39	35 <= age <= 39	8,667	0.109	0.311
age 40-44	40 <= age <= 44 [*]	8,667	0.103	0.305
age 45-49	45 <= age <= 49	8,667	0.100	0.300
age 50-54	50 <= age <= 54	8,667	0.091	0.288
age 55-59	55 <= age <= 59	8,667	0.071	0.257
age 60-64	60 <= age <= 64	8,667	0.070	0.255
age 65-69	65 <= age <= 69	8,667	0.066	0.248
age 70-74	70 <= age <= 74	8,667	0.056	0.231
age 75-79	75 <= age <= 79	8,667	0.052	0.222
age 80-84	80 <= age <= 84	8,667	0.025	0.155
age 85+	85 <= age	8,667	0.020	0.141

Normalized sampling weights were used.

Table 9: summary statistics of social status in the HIS 2001

Variable	Description	Obs	Mean	Stdev
em	1 if blue/white collar, civil servant, or paid work=other, 0 otherwise [*]	8,667	0.472	0.499
sel	1 if self-employed, 0 otherwise	8,667	0.075	0.264
ret_em	1 if retired & last work=em, 0 otherwise	8,667	0.198	0.399
ret_selnw	1 if retired & last work=sel/nw, 0 otherwise	8,667	0.064	0.245
sidi_em	1 if sick-disability & last work=em, 0 otherwise	8,667	0.023	0.151
sidi_selnw	1 if sick-disability & last work=sel/nw, 0 otherwise	8,667	0.006	0.076
unem_em	1 if unemployed & last work=em, 0 otherwise	8,667	0.051	0.219
unem_selnw	1 if unemployed & last work=sel/nw, 0 otherwise	8,667	0.010	0.097
nw	1 if student/housework/no work, 0 otherwise	8,667	0.101	0.302

Normalized sampling weights were used.

Table 10: summary statistics of geographical variables in HIS 2001

Variable	Description	Obs	Mean	Stdev
provantwerp	1 if province of Antwerpen, 0 otherwise [*]	8,667	0.168	0.374
provvlbrabant	idem for province of Vlaams Brabant	8,667	0.095	0.294
provwestvl	idem for province of West-Vlaanderen	8,667	0.107	0.309
provoostvl	idem for province of Oost-Vlaanderen	8,667	0.141	0.348
provlimburg	idem for province of Limburg	8,667	0.079	0.270
provbrussel	idem for province of Brussels	8,667	0.095	0.293
provbrabantw	idem for province of Brabant Wallon	8,667	0.026	0.160
provhainaut	idem for province of Hainaut	8,667	0.130	0.336
provliège	idem for province of Liège	8,667	0.097	0.296
provluxemb	idem for province of Luxembourg	8,667	0.025	0.155
provnamur	idem for province of Namur	8,667	0.037	0.189

Normalized sampling weights were used.

Table 11: summary statistics of insurance variables in HIS 2001

Variable	Description	Obs	Mean	Stdev
preftreat	1 if reduction of co-payments, 0 otherwise	8,667	0.136	0.343
wdro	1 if WDRO, 0 otherwise	8,667	0.112	0.316
elderly	1 if entitlement to guaranteed minimum income, guaranteed income for elderly or subsistence income; 0 otherwise	8,667	0.005	0.069

Normalized sampling weights were used.

REFERENCES

1.Docteur E, Oxley H. Health care systems: lessons from the reform experience. Report. Paris: 2003. OECD Health Working Papers Available from: http://www.oecd.org/dataoecd/5/53/22364122.pdf

2.van de Ven W. De rol van ziektekostenverzekering. In: Lapré R, Rutten F, Schut E, editors. Algemene economie van de gezondheidszorg. Amsterdam: Elsevier; 2001. p. 89-120.

3.Rice T. The economics of health reconsidered. Chicago: Health Administration Press; 1998.

4. van Doorslaer E, Wagstaff A, Bleichrodt H, Calonge S, Gerdtham UG, Gerfin M, et al. Income-related inequalities in health: some international comparisons. J Health Econ. 1997;16(1):93-112.

5. Cutler D, Zeckhauser R. The anatomy of health insurance. In: Culyer A, Newhouse J, editors. Handbook of Health Economics. Amsterdam: Elsevier; 2000. p. 563-643.

6. Zweifel P, Manning W. Moral hazard and consumer incentives in health care. In: Culyer A, Newhouse J, editors. Handbook of Health Economics. Amsterdam: Elsevier; 2000. p. 409-59.

7. Colombo F, Tapay N. Private health insurance in OECD countries: the benefits and costs for individuals and health systems. Report. Paris: 2004. OECD Health Working Papers Available from: http://www.oecd.org/dataoecd/34/56/33698043.pdf

8. OECD. Private health insurance in OECD countries. Report. 2004. OECD Policy Brief Available from: http://www.oecd.org/dataoecd/42/6/33820355.pdf#search=%22oecd%20policy%20brief%20private%20health%20insurance%22

9. Alan S, Crossley TF, Grootendorst P, Veall MR. The effects of drug subsidies on out-of-pocket prescription drug expenditures by seniors: regional evidence from Canada. J Health Econ. 2002;21(5):805-26.

10. Bao Y, Sturm R. The effects of state mental health parity legislation on perceived quality of insurance coverage, perceived access to care, and use of mental health specialty care. Health Serv Res. 2004;39(5):1361-77.

11. Buchmueller TC, Couffinhal A, Grignon M, Perronnin M. Access to physician services: does supplemental insurance matter? evidence from France. Health Econ. 2004;13(7):669-87.

12. Cockx B, Brasseur C. The demand for physician services. Evidence from a natural experiment. J Health Econ. 2003;22(6):881-913.

13. Courbage C, de Coulon A. Prevention and Private Health Insurance in the UK. The Geneva Papers on Risk and Insurance. 2004;29(4):719-27.

14. Dafny L, Gruber J. Public insurance and child hospitalizations: access and efficiency effects. Journal of Public Economics. 2005;89(1):109-29.

15. Deb P, Trivedi PK. The structure of demand for health care: latent class versus two-part models. J Health Econ. 2002;21(4):601-25.

16. Hadley J, Holahan J. Is health care spending higher under Medicaid or private insurance? Inquiry. 2003;40(4):323-42.

17. Hargraves JL, Hadley J. The contribution of insurance coverage and community resources to reducing racial/ethnic disparities in access to care. Health Serv Res. 2003;38(3):809-29.

18. Harmon C, Nolan B. Health insurance and health services utilization in Ireland. Health Econ. 2001;10(2):135-45.

19. Hong G, Kim s. Out-of-pocket health care expenditure patterns and financial burden across the life cycle stages. The Journal of Consumer Affairs. 2000;34(2):291-313.

20. Ii M, Ohkusa Y. Price sensitivity of the demand for medical services for minor ailments: econometric estimates using information on illnesses and symptoms. The Japanese Economic Review. 2002;53(2):154-66.

21. Ii M, Ohkusa Y. Should the coinsurance rate be increased in the case of the common cold? An analysis based on an original survey. Journal of the Japanese and International Economies. 2002;16(3):353-71.

22. Jones A, Koolman X, van Doorslaer E. The impact of supplementary private health insurance on the use of specialists in European countries. Report. 2004. ECuity III project WP 21 Available from: http://www2.eur.nl/bmg/ecuity/public_papers/ECuity3WP21August%202005.pdf

23. Lundin D. Moral hazard in physician prescription behavior. J Health Econ. 2000;19(5):639-62.

24. Meer J, Rosen HS. Insurance and the utilization of medical services. Soc Sci Med. 2004;58(9):1623-32.

25. Remler DK, Atherly AJ. Health status and heterogeneity of cost-sharing responsiveness: how do sick people respond to cost-sharing? Health Econ. 2003;12(4):269-80.

26. Riphahn R, Wambach A, Million A. Incentive effects in the demand for health care: a bivariate panel count data estimation. Journal of Applied Econometrics. 2003;18:387-405.

27. Rodriguez M, Stoyanova A. The effect of private insurance access on the choice of GP/specialist and public/private provider in Spain. Health Econ. 2004;13(7):689-703.

28. Schellhorn M. The effect of variable health insurance deductibles on the demand for physician visits. Health Econ. 2001;10(5):441-56.

29. Thomas K, Snowden L. Minority Response to Health Insurance Coverage for Mental Health Services. J Ment Health Policy Econ. 2001;4(1):35-41.

30. Tye S, Phillips KA, Liang S-Y, Haas JS. Moving beyond the typologies of managed care: the example of health plan predictors of screening mammography. Health Serv Res. 2004;39(1):179-206.

31. Van de Voorde C, Van Doorslaer E, Schokkaert E. Effects of cost sharing on physician utilization under favourable conditions for supplier-induced demand. Health Econ. 2001;10(5):457-71.

32. van Vliet R. Effects of price and deductibles on medical care demand, estimated from survey data. Applied Economics. 2001;33(12):1515-24.

33. Winkelmann R. Co-payments for prescription drugs and the demand for doctor visits--evidence from a natural experiment. Health Econ. 2004;13(11):1081-9.

34. Yoshida A, Takagi S. Effects of the reform of the social medical insurance system in Japan. The Japanese Economic Review. 2002;53(4):444-65.

35. Volksgezondheid WIV [Homepage on the Internet]. Gezondheidsenquête in België door Interview [updated 2006-07-20; cited 2006-09-30]. Available from: http://www.iph.fgov.be/epidemio/epinl/index4.htm

36. Demarest S, Van der Heyden J, Gisle L, Buziarsist J, Miermans P, Sartor F, et al. Gezondheidsenquête door middel van Interview, België, 2001. Report. Brussel: Wetenschappelijk Instituut Volksgezondheid: Afdeling Epidemiologie; 2002. IPH/EPI REPORTS

37. Berghman J, Meerbergen E. Aanvullende sociale voorzieningen in de tweede en derde pijler. Report. Brussel: Federaal Wetenschapsbeleid; 2005. (AG/01/084) Available from: http://www.belspo.be/belspo_off/home/publ/pub_ostc/agora/ragff084_nl.pdf

38. Van de Voorde C. Gezondheid van en gezondheidszorg voor ouderen in België. Presentation at the Belgian-SHARE launch; 2005.

39. Garrow JS. Treatment of obesity. Lancet. 1992;340(8816):409-13.

40. Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med. 1997;27(1):191-7.

41. Deragotis L [Homepage on the Internet]. [cited 2006-09-30]. Symptom Checklist-90-Revised. Available from: www.pearsonassessments.com/tests/scl90r.htm

42. Deragotis L, Meyer J, King K. Psychopathology in individuals with sexual dysfunction. American Journal of Psychiatry. 1981;138(6):757–63.

43. Johnson R, Wichern D. Applied multivariate statistical analysis. Fifth ed. Prentice Hall; 2002.

This page is left intentionally blank.

Dépôt légal : D/2006/10.273/69

KCE reports

1. Efficacité et rentabilité des thérapies de sevrage tabagique. D/2004/10.273/2.
2. Etude relative aux coûts potentiels liés à une éventuelle modification des règles du droit de la responsabilité médicale (Phase 1). D/2004/10.273/4.
3. Utilisation des antibiotiques en milieu hospitalier dans le cas de la pyélonéphrite aiguë. D/2004/10.273/6.
4. Leucoréduction. Une mesure envisageable dans le cadre de la politique nationale de sécurité des transfusions sanguines. D/2004/10.273/8.
5. Evaluation des risques préopératoires. D/2004/10.273/10.
6. Validation du rapport de la Commission d'examen du sous financement des hôpitaux. D/2004/10.273/12.
7. Recommandation nationale relative aux soins prénatals: Une base pour un itinéraire clinique de suivi de grossesses. D/2004/10.273/14.
8. Systèmes de financement des médicaments hospitaliers: étude descriptive de certains pays européens et du Canada. D/2004/10.273/16.
9. Feedback: évaluation de l'impact et des barrières à l'implémentation – Rapport de recherche: partie 1. D/2005/10.273/02.
10. Le coût des prothèses dentaires. D/2005/10.273/04.
11. Dépistage du cancer du sein. D/2005/10.273/06.
12. Etude d'une méthode de financement alternative pour le sang et les dérivés sanguins labiles dans les hôpitaux. D/2005/10.273/08.
13. Traitement endovasculaire de la sténose carotidienne. D/2005/10.273/10.
14. Variations des pratiques médicales hospitalières en cas d'infarctus aigu du myocarde en Belgique. D/2005/10.273/12
15. Evolution des dépenses de santé. D/2005/10.273/14.
16. Etude relative aux coûts potentiels liés à une éventuelle modification des règles du droit de la responsabilité médicale. Phase II : développement d'un modèle actuariel et premières estimations. D/2005/10.273/16.
17. Evaluation des montants de référence. D/2005/10.273/18.
18. Utilisation des itinéraires cliniques et guides de bonne pratique afin de déterminer de manière prospective les honoraires des médecins hospitaliers: plus facile à dire qu'à faire.. D/2005/10.273/20
19. Evaluation de l'impact d'une contribution personnelle forfaitaire sur le recours au service d'urgences. D/2005/10.273/22.
20. HTA Diagnostic Moléculaire en Belgique. D/2005/10.273/24, D/2005/10.273/26.
21. HTA Matériel de Stomie en Belgique. D/2005/10.273.28.
22. HTA Tomographie par Emission de Positrons en Belgique. D/2005/10.273/30.
23. HTA Le traitement électif endovasculaire de l'anévrysme de l'aorte abdominale (AAA). D/2005/10.273.33.
24. L'emploi des peptides natriurétiques dans l'approche diagnostique des patients présentant une suspicion de décompensation cardiaque. D/2005/10.273.35
25. Endoscopie par capsule. D2006/10.273.02.
26. Aspects médico-légaux des recommandations de bonne pratique médicale. D2006/10.273/06.
27. Qualité et organisation des soins du diabète de type 2. D2006/10.273/08.
28. Recommandations provisoires pour les évaluations pharmacoéconomiques en Belgique. D2006/10.273/11.
29. Recommandations nationales Collège d'oncologie : A. cadre général pour un manuel d'oncologie B. base scientifique pour itinéraires cliniques de diagnostic et traitement, cancer colorectal et cancer du testicule. D2006/10.273/13.
30. Inventaire des bases de données de soins de santé. D2006/10.273/15.
31. Health Technology Assessment : l'antigène prostatique spécifique (PSA) dans le dépistage du cancer de la prostate. D2006/10.273/18.
32. Feedback: évaluation de l'impact et des barrières à l'implémentation - Rapport de recherche: partie II. D2006/10.273/20.
33. Effets et coûts de la vaccination des enfants Belges au moyen du vaccin conjugué antipneumococcique. D2006/10.273/22.
34. Trastuzumab pour les stades précoces du cancer du sein. D2006/10.273/24.

35. Etude relative aux coûts potentiels liés à une éventuelle modification des règles du droit de la responsabilité médicale – Phase III : affinement des estimations. D2006/10.273/27.
36. Traitement pharmacologique et chirurgical de l'obésité. Prise en charge résidentielle des enfants sévèrement obèses en Belgique. D/2006/10.273/29.
37. Health Technology Assessment Imagerie par Résonance Magnétique. D/2006/10.273/33.
38. Dépistage du cancer du col de l'utérus et recherche du Papillomavirus humain (HPV). D/2006/10.273/36
39. Evaluation rapide de technologies émergentes s'appliquant à la colonne vertébrale : remplacement de disque intervertébral et vertébro/cyphoplastie par ballonnet. D/2006/10.273/39.
40. Etat fonctionnel du patient: un instrument potentiel pour le remboursement de la kinésithérapie en Belgique? D/2006/10.273/41.
41. Indicateurs de qualité cliniques. D/2006/10.273/44.
42. Etude des disparités de la chirurgie élective en Belgique. D/2006/10.273/46.
43. Mise à jour de recommandations de bonne pratique existantes. D/2006/10.273/49.
44. Procédure d'évaluation des dispositifs médicaux émergeants. D/2006/10.273/51.
45. HTA Dépistage du Cancer Colorectal : état des lieux scientifique et impact budgétaire pour la Belgique. D/2006/10.273/54.
46. Health Technology Assessment. Polysomnographie et monitoring à domicile des nourrissons en prévention de la mort subite. D/2006/10.273/60.
47. L'utilisation des médicaments dans les maisons de repos et les maisons de repos et de soins Belges. D/2006/10.273/62
48. Lombalgie chronique. D/2006/10.273/64.
49. Médicaments antiviraux en cas de grippe saisonnière et pandémique. Revue de littérature et recommandations de bonne pratique. D/2006/10.273/66.
50. Contributions personnelles en matière de soins de santé en Belgique. L'impact des suppléments. D/2006/10.273/69.