

REFERRAL DURING LOW-RISK PREGNANCY FOLLOW-UP IN PRIMARY CARE



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ELENA COSTA, WENDY CHRISTIAENS, RENATE ZEEVAERTN, NADIA BENAHMED



COLOPHON

Title:	Referral during low-risk pregnancy follow-up in primary care
Authors:	Elena Costa (KCE), Wendy Christiaens (KCE), Renate Zeevaert (KCE), Nadia Benahmed (KCE)
Information specialist:	Nicolas Fairon (KCE)
Project facilitator:	Els Van Bruystegem (KCE)
Reviewers:	Diego Castanaras-Zapatero (KCE), Célia Primus (KCE), Marijke Eyssen (KCE)
Delphi panel members:	Gynaecologists: Sophie Alexander (ULB - Université libre de Bruxelles), Patricia Barlow (CHU Saint-Pierre, Bruxelles), Tom Bovyn (VVOG - Vlaamse vereniging voor obstetrie en gynaecologie, Voorzitter beroepsbelangencommissie), Gilles Ceysens (ONE - Office de la naissance et de l'enfance), Frédéric Chantraine (CHU Liège, Hôpital Citadelle), Luc De Catte (VVOG), Frédéric Debiève (CRGOLFB - Collège Royal des Gynécologues Obstétriciens de Langue Française de Belgique, UCLouvain - Université catholique de Louvain), Wilfried Gyselaers (Universiteit Hasselt), Griet Vandenberghe (UZ Gent, B.OSS - Belgian Obstetric Surveillance System), Guy Verhulst (Algemeen Stedelijk Ziekenhuis – ASZ Aalst, VVOG) Midwives: Eva Bruneel (VBOV - Vlaamse beroepsorganisatie van vroedvrouwen), Murielle Conradt (UPSfB - Union Professionnelle des Sages-Femmes Belges), Alexandra Denys (Werkgroep Vroedvrouwgeleide geboorte, VBOV, BMA - Belgian Midwives Association), Charlotte Gijssens (VBOV), Ana Hernandez (ONE), Sarah Michel (UPSfB), Kelly Schoonbaert (CHU-Brugmann, Erasmushogeschool Brussel), Maity Van Rillaer (Vzw De Bakermat), Sabine Van Vyver (VBOV), Michèle Warnimont (Le Cocon, Hôpital Erasme) General Practitioners: Carmen Binst (Domus medica), Ester Blomme, Camille Dubus, Céline Gortz, Madieke Maseman, Olivier Montigny, Davina Paredis (KU Leuven), Muriel Quisquater (SSMG – Société Scientifique de Médecine Générale), Eline Sinnaeve, Alexandra Sousa (Maison Médicale, Saint Leonard)
External experts:	Patricia Barlow (CHU Saint-Pierre, Bruxelles), Katrien Beeckman (VBOV, VUB, Vrije Universiteit Brussel, UZ Brussel), Carmen Binst (Domus medica), Tom Bovyn (VVOG), Eva Bruneel (VBOV), Gilles Ceysens (ONE), Frédéric Chantraine (CHU Liège, Hôpital Citadelle), Murielle Conradt (UPSfB), Luc De Catte (VVOG), Frédéric Debiève (CRGOLFB, UCLouvain), Marlies Eggermont (Universiteit Gent, FLOW law advocaten), Charlotte Gijssens (VBOV), Wilfried Gyselaers (Universiteit Hasselt), Ana Hernandez (ONE), Sarah Michel (UPSfB), Muriel Quisquater (SSMG), Kelly Schoonbaert (CHU-Brugmann, Erasmushogeschool Brussel), Sabine Van Vyver (VBOV), Griet Vandenberghe (UZ Gent, B.OSS), Guy Verhulst (ASZ, VVOG), Michèle Warnimont (Le Cocon, Hôpital Erasme)
Stakeholders:	Elisabeth Coppens (VBOV), Mickael Daubie (INAMI – RIZIV - Institut national d'assurance maladie-invalidité – Rijksinstituut voor ziekte- en invaliditeitsverzekering), Katelijne De Koster (VBOV), Toenga De Vos (VVOG),



	Alexandra Denys (Werkgroep Vroedvrouwgeleide geboorte, VBOV, BMA - Belgian Midwives Association), Liesbeth Lewi (College Moeder kind, geneesheer specialist), Anne Niset (AFSFC - Association Francophone des Sages-femmes Catholiques), Christian Norgaard (CRGOLFB, HEAL Clinic, CHIREC), Marlene Reyns (VBOV), Anke Thaens (VVOG), Elke Van Den Bergh (Zwanger in Brussel), Patrick Verliefde (RIZIV – INAMI), Lies Versavel (VBOV), Valerie Wijckmans (VBOV), Vanessa Wittvrouw (UPSfB)
External validators:	Bahareh Goodarzi (Vrije Universiteit Amsterdam, Rijksuniversiteit Groningen, The Netherlands), Sophie Thunus (Professor, PhD, UCLouvain), Gian Carlo Di Renzo (Centre for Perinatal and Reproductive Medicine, University of Perugia, Perugia Italy, Wayne State University Medical School, Detroit, USA)
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Presidency or accountable function within an institution, association, department or other entity on which the results of this report could have an impact: Toenga De Vos (Treasurer VVOG), Liesbeth Lewi (See above - chairman of the VVOG obstetrics working group), Anke Thaens (Secretary VVOG), Valerie Wijckmans (VBOV), Vanessa Wittvrouw (President at UPSfB),

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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
ACNM	American College of nurse-midwives
ACOG	American College of Obstetricians and Gynecologists
Alpha	antenatal psychosocial health assessment
CMV	Cytomegalovirus
CPAS / OCMW	Centre Public d'Action Sociale / Openbaar Centrum voor Maatschappelijk Welzijn
CRGOLFB	Collège Royale des gynécologues obstétriciens de langue française de Belgique
FMF	Fetal Medicine Foundation
GP	General practitioner
HAS	Haute Autorité de Santé
IOM	Institute Of Medicine
K&G	Kind en Gezin - Opgroeien
LMC	Lead Medical Carer
NICE	National Institute for Health and Care Excellence
NIHDI	National Institute for Health and Disability Insurance
NIPT	Non-Invasive Prenatal Testing
ONE	Office de la Naissance et de l'Enfance
R4U	Rotterdam Reproduction Risk Reduction checklist
SSMG	Société Scientifique de Médecine Générale
UGent	Universiteit Gent
UK	United Kingdom
UPSfB	Union Professionnelle des Sages-Femmes Belges
USA	United States of America
VBOV	Vlaamse Beroepsorganisatie van Vroedvrouwen



VIL	Verloskundige Indicatielijst (Netherlands)
VVOG	Vlaamse Vereniging voor Obstetrie en Gynaecologie
WHO	World Health Organization



GLOSSARY

Antenatal care

It can be defined as the care provided to childbearing women in order to warrant the best health conditions for both mother and baby during pregnancy to reach the best maternal and child health outcomes. Antenatal care aims to reduce maternal and perinatal morbidity and mortality both directly, through detection and management of pregnancy-related complications, and indirectly, through the identification of women at increased risk of developing complications during labour and delivery, thus ensuring referral to an appropriate level of care. Risk identification; prevention and management of pregnancy-related or concurrent diseases; and health education and health promotion are the component of antenatal care.¹

Low-risk pregnancy

Defining a low-risk pregnancy requires the identification of risk factors that distinguish low-risk pregnancies from high-risk pregnancies; this latter may require additional care or management. A high-risk status is based on the presence of one or more distinct medical or obstetric risk for adverse outcomes. Non-medical factors such as migrant status, low income, lack of social support, or young age are also proved to be associated with adverse birth outcomes (e.g. foetal death, neonatal death, small for gestational age, preterm birth, or low Apgar-score).² Listing exhaustively all risk factors is challenging. During the development of the national guideline regarding clinical assessment and screening tests during pregnancy (KCE report 248)³, an indicative list of risk factors was provided. Some pregnant women cumulate more than one risk factor from diverse categories. The risk status is never definitive and can evolve during pregnancy, requiring additional care or referral towards specialised services. In the absence of any of these risk factors, a pregnancy is considered a low-risk pregnancy. This status has to be considered as a temporary status that needs to be regularly monitored until delivery.

Midwifery-led care

It can define as care provided by a midwife or a group of midwives as lead professional in the planning, organisation and delivery of care given to a woman from initial booking to postnatal period. Additional care may provided in collaboration with medical staff.⁴

In Belgium, midwifery-led antenatal care includes 2 mandatory consultations with a medical doctor. For more details see the legal framework in section 1.1.2

**Clinical follow-up of low-risk pregnancies**

In the context of low-risk pregnancies, the clinical follow-up consists of a clinical evaluation, a technical examination (foetal heart auscultation and ultrasound), a haematological assessment, an assessment of infectious diseases and a screening for maternal clinical problems (such as gestational diabetes). All interventions regarding the clinical follow-up of low-risk pregnancies and their planning during the pregnancy are described in KCE report 248.³

In low-risk pregnancies, all these interventions may be performed by gynaecologists, midwives (except the morphological ultrasound during the second trimester) or GPs (except ultrasounds). It should be noted that midwives are legally authorised to perform ultrasounds during the first and third trimesters but the legal framework (implementing decree) is not yet published. Meanwhile, the ultrasounds are only performed by gynaecologists. In the clinical follow-up program for women with a low-risk pregnancy, the recommended number of clinical follow-up consultations is 7 for the multiparous women and 10 for the primiparous ones.³ This number of consultations encompasses the consultations with gynaecologists, with midwives and with GPs involved in the antenatal follow-up.



■ SCIENTIFIC REPORT

Disclaimer

The purpose of this report is NOT to recommend one type of follow-up against another for low-risk pregnancy. According to the patients' right law⁵, the pregnant woman has the right to freely choose her healthcare practitioner and she has the right to modify her choice throughout her pregnancy.

In this report, we used the term 'pregnant women' to refer to any person being pregnant, including pregnancy in teens, trans and non-binary people. In addition, the terms 'gynaecologist' and 'obstetrician' were used interchangeably.

1 INTRODUCTION

1.1 Overview of the antenatal care organisation in Belgium

As mentioned in KCE report 326⁶, the core principle of antenatal care should be to provide universal and integrated healthcare services during pregnancy to ensure optimal health and safety for all pregnant women throughout Belgium. Therefore, antenatal care should be tailored in size and intensity according to the pregnant women's needs (proportionate universalism)⁷. To provide this tailored care, several professionals are engaged and their activities are based on a defined legislative framework.

1.1.1 Professionals involved in antenatal follow-up

Antenatal care professionals and place of care

In Belgium, a pregnant woman can opt for an antenatal follow-up led by a gynaecologist, with the possible contribution of a midwife or a general practitioner (GP), or a follow up led by a midwife or a GP with the contribution of a gynecologist. Midwife-led antenatal care can take several forms and vary within and between regions, between hospitals and private midwifery practices. Midwife-led antenatal care can occur in hospitals, in clinics of the Office de la naissance et de l'enfance (ONE), and in private midwifery practices. Private practices can be solo or group practices. The group practices can be mono- or multidisciplinary and may or may not include gynaecologists. The antenatal care provided by GPs mainly occurs in their private practices or in ONE clinics. Pregnant women can consult a gynaecologist directly at a hospital or at a private practice or, less frequently, in an ONE clinic. There is no gatekeeping system: a pregnant woman can directly access a medical specialist without being referred by a primary care provider such as a GP or a midwife. This freedom of choice of care provider is guaranteed by the patient's rights law (art 6).⁵ In addition, the law also confers women the right to modify their choice of care provider during the clinical pregnancy follow-up. Based on these principles, an antenatal care pathway for low-risk pregnancies was proposed in report KCE 326.⁶



Care consumption

In 2016, almost all low-risk pregnant women covered by healthcare insurance had consulted a gynaecologist at least once during their pregnancy (see Figure 1). At this time, pregnant women saw a gynaecologist 10 times during their pregnancy follow-up (Figure 2). The proportion of women who received at least one consultation from a midwife is lower than the proportion of women with a least one consultation from a gynaecologist. Although this proportion has approximately doubled between 2010 and 2016, the number of consultations remained low (see Figure 1 and Figure 2). Pregnancy follow-up by general practitioners is difficult to quantify using healthcare nomenclature as the nomenclature codes do not allow disentangling antenatal care activities from other medical procedures. Therefore, we can only conclude that in 2016, about 9 out of 10 pregnant women living in Flanders consulted a general practitioner during their pregnancy. This was the case for 7 out of 10 women in Wallonia and only 5 out of 10 women in Brussels. The median number of consultations during pregnancy was 4, 2, and 2 respectively for Flanders, Brussels, and Wallonia.

Figure 1 – Proportion of low-risk pregnant women who attended at least one consultation during their pregnancy by healthcare professional, in 2016

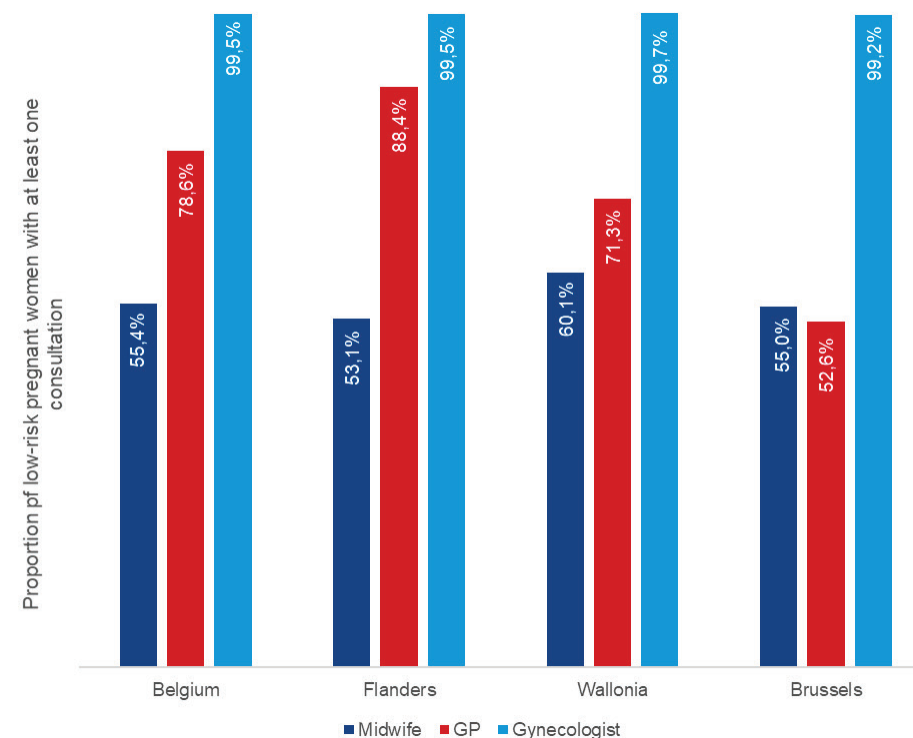
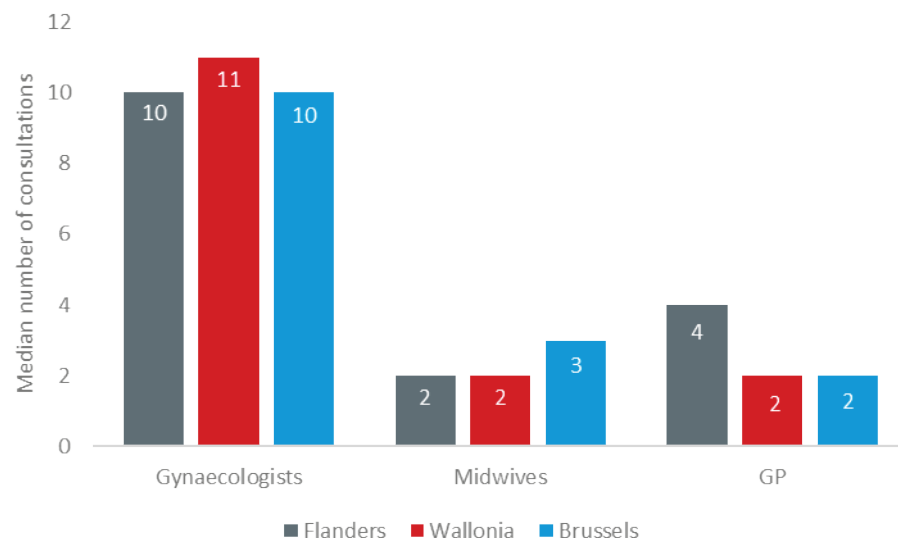




Figure 2 – Median number of consultations during low-risk pregnancy follow-up in 2016



1.1.2 Legal framework

Healthcare professionals choose freely, within the limits of the competencies defined by the law, the means used for diagnosis and treatment. While the antenatal activities of medical doctors are not defined by the law, the boundaries of midwifery are detailed in the legislation. According to the law⁸, midwives may perform some activities autonomously while others must be performed under the supervision of a physician (see Box 2). During the pregnancy follow-up, after having taken a careful and complete anamnesis, midwives⁹

- must advise pregnant women to undergo a medical examination^a during the first and the last trimester of their pregnancy.
- may confirm a pregnancy
- must screen for high-risk pregnancies through
 - weighing;
 - examination of the urine;
 - checking the blood pressure;
 - measurement of the height of the uterine fundus;
 - abdominal palpation;
 - auscultation of the foetal heart sounds;
 - vaginal and speculum examination;
 - monitoring by cardiotocography;
 - requesting for an ultrasound examination by a specialised doctor;
 - requesting for blood tests and other complementary examinations in the context of the practice of obstetrics

From 2006 onwards, midwives^b are allowed to prescribe a limited list of drugs.⁸ This list of drugs used during the follow-up of low-risk pregnancies¹¹ is available in Box 1.

^a The law did not define the term 'medical examination' nor which medical doctor must perform the examination

^b Midwives graduated before 2014 must follow an additional training to be allowed to prescribe medicines.¹⁰

**Box 1 – List of drugs prescribed by midwives during the follow-up of low-risk pregnancies^c**

- Folic Acid: 0,4 mg or 4 mg tablets (branded medicines or magistral formula). Primary and secondary prevention of open neural tube defects.
- Metoclopramide: syrup of 5 mg/5 ml. Antiemetic.
- Paracetamol: 0,5 - 1 g tablets, 600 mg suppositories. Painkiller, antipyretic.
- Anti-infectious vaginal cream and pessaries: treatment of symptomatic vaginal infections.
- Nitrofurantoïne: 50 - 100 mg tablets. Antiseptic in case of asymptomatic urinary infection (until the 36th week of pregnancy).
- Anti-Rh D Immunoglobulins: IM ampoules. Prevention of iso-immunisations in Rh (D)-negative mothers.
- Influenza vaccines: prevention of influenza.
Combined diphtheria/petussis/tetanus vaccines: to protect the newborn during the first weeks against different diseases waiting his/her vaccination.
- Oral preparation with iron: treatment of low ferritin level.
- Omeprazole : 20 mg.
Treatment of reflux
- Micronized progesterone: 200 mg. Oral or vaginal administration.
Prevention of symptomatic uterine activity.

1.1.3 Medico-legal liability

The law does not provide a definition of low-risk pregnancy nor high-risk pregnancy or referral obligation.¹² The appropriateness of a healthcare practitioner's antenatal care provision can be assessed from at least three different perspectives: the civil law perspective, the criminal law perspective, and the deontological perspective. More details on civil and criminal liabilities, as well as the deontological sanctions can be found in the supplement of KCE report 326.¹³ These approaches are not mutually exclusive, meaning that the same malpractice can lead to both civil obligations for compensation purposes, criminal sanctions, and deontological measures. Additionally, in the future, the quality of the care provision will be assessed by the federal public health authorities and can lead to sanctions regarding the license to practice. In practice, during pregnancy follow-up, a midwife will be personally responsible for the acts falling within her/his field of competence (see autonomous midwifery activities in box 1), even if she/he is a hospital employee. However, if the midwife properly referred pathological or risky situations to a doctor, this doctor will be responsible for actions performed by the midwife under his/her supervision. Usually, doctors and midwives have an obligation of means, i.e. the implementation of normal and timely efforts (e.g. imaging, lab tests...). Finally, when a medical or obstetrical problem occurs or may potentially cause harmful effects for the mother or her unborn child(ren), the pregnant woman has to be addressed or referred to a healthcare practitioner whose competence and experience are recognised to adequately manage the problem (Quality of the healthcare practice Law).¹⁴ The interested reader may find additional information in the supplement of KCE report 326 (see section 2.3.2).¹³

^c The Royal Decree of 31 January 2018 mentioned also Ranitidine 150 mg. The European Medicines Agency (EMA) has recommended to suspend the sale of all ranitidine-based medicines in the European Union due to the presence of a low level of NDMA (N-nitrosodimethylamine). These medicines are not more available in Belgium since September 2019.

**Box 2 – Legal framework of midwifery in Belgium (Law of 10 May 2015 regarding the practice of healthcare professions)⁸**

Autonomous midwifery activities are:

- Pregnancy diagnosis ;
- during pregnancy, delivery, and postpartum, monitoring pregnancies and counseling women regarding care and advice;
- the follow-up of low-risk pregnancy, performing spontaneous deliveries, caring for neonates and infants
- preventive measures and assessment of risks for mothers and children;
- in case of emergency, providing needed care until the assistance of a physician is available;
- the provision of information and health education regarding women, the family, and society;
- the provision of antenatal education and parenthood preparation programs;
- the provision of a written report, when needed.

1.2 Scope of the study

Over the past 10 years, healthcare consumption recording in the NIDIH databases shows an increase in antenatal follow-up by midwives. This implication of midwives in the antenatal follow-up is more frequent in Brussels than in the other two regions of the country (see Figure 20 in KCE report 326).⁶ In 2019, the authors of this report⁶ proposed a pathway for antenatal care supported by a clear referral system between professionals to ensure safe transitions between professionals and from primary to specialised care with the subsidiarity principle in mind. Tools may be an option to support timely referral from primary care to specialised care and back-referral from specialised care to primary care when possible. As shown

in report KCE report 326⁶, in some countries such tools are used to support the implementation of their antenatal care pathway.

In Belgium, some midwives, as providers of antenatal care in the first line, reported using tools to support their decision to refer pregnant women to specialist care. They often use the Dutch obstetric list for that purpose. However, this tool is developed in and adapted to the specific Dutch context, which differs profoundly from the Belgian context. Hence, the transferability of the Dutch obstetric list, as any other list from abroad, to Belgium is limited. Therefore, midwives were requesting a referral instrument adapted to the Belgian context and ideally also supported by the majority of all providers of antenatal care. As a consequence, the Flemish association of midwives (Vlaamse Beroepsorganisatie van Vroedvrouwen – VBOV) and a midwifery practice in Brussels (Zwanger in Brussel CVBA) asked KCE to develop such a tool.

The purpose of this report is to develop such a tool to support a safe and seamless transition from one healthcare professional to another for providers of antenatal follow-up. In concertation with the stakeholder and expert group composed for this project (see colophon), it was decided to limit the scope of this report to referral decisions during the antenatal follow-up in low-risk pregnancies, hence not to include decisions regarding the place of birth. Therefore, tools to discuss place of birth are out of the scope for this report. Other non-recognised actors in the field who propose assistance to women before, during, or after childbirth (e.g. doulas) are also out of the scope of the present report.

The following research questions are addressed in this report:

Main research questions:

1. Which clinical situations (or criteria) should be included for a Belgian referral tool to be used during the antenatal follow-up in primary care?
2. Which referral actions should be taken in response to each clinical situation reported on a Belgian referral tool to be used during the antenatal follow-up in primary care?

**Preparatory research questions:**

1. What are the barriers and facilitators to collaboration between gynaecologists and midwives?
2. Which instruments are used abroad, for risk assessment during antenatal follow-up in primary care?
3. Which instruments are used in Belgium, for risk assessment during antenatal follow-up in primary care?

This report completes a series of KCE reports related to pregnancy. From this series, two reports are linked to antenatal care. Firstly, KCE report 248³ proposed an evidence-based guideline on recommended clinical assessment and screening tests during a low-risk pregnancy. Secondly, KCE report 326⁶, proposed an antenatal care pathway. The KCE report 326⁶ also stressed the importance of creating a clear referral system between primary care providers and specialised care providers by using a list of obstetrical red flags during the antenatal follow-up.

2 METHODS

2.1 A multimodal approach

A multimodal approach was followed combining literature reviews, quantitative and qualitative research methods.

The preparatory research questions were used to answer the 2 main research questions.

Research question 4 on foreign experience with risk assessment during antenatal follow-up was addressed by a review of the international peer-reviewed scientific literature. Research question 5 focusing on referral practice in Belgium was addressed by means of an online survey targeting all Belgian midwives and gynaecologists..

Because there is no relevant evidence on referral options during the antenatal follow-up in primary care¹⁵, referral tools or referral guidances are based on expert consensus, based on their knowledge and experience, and the evidence of potential complications reported in the scientific peer-reviewed literature.¹⁵⁻¹⁹ Therefore we opted for a modified Delphi method as reported in the more recent guideline on stratification of clinical risk in pregnancy.¹⁸

The findings of research questions 4 and 5 were combined to build the body of evidence to start a modified Delphi method to collect data for research questions 1 and 2. The Delphi method was modified in the sense that the first round did not consist of open-ended questions as usual in Delphi studies. Instead we used the criteria (clinical situations) we found in other instruments (see research question 4 and 5) as a starting point. This way we started with an exhaustive and solid list of criteria. The Delphi method was chosen because it allows:



- Rapid response from experts in different geographical localisations, especially in a COVID period
- Flexibility in filling in the questionnaire. It was particularly important because of the fluctuating working hours of our target population (i.e. day and night shifts). The participants had also the option to resume the questionnaire at any time.
- Anonymous exchange of arguments, especially in a context of interprofessional tensions. It avoids dominant opinions, peer pressure to select specific answers and makes it therefore easier for experts to express their own opinion..

Based on a review of the international peer-reviewed scientific literature, the findings of research question 3 were used to build recommendations on the implementation of a referral tool in Belgium.

2.2 Formulation of recommendations

To formulate relevant recommendations for supporting the referral decision when antenatal care is provided by primary care providers, a list of 8 recommendations were drafted by the KCE team and discussed with a panel of experts and stakeholders during a meeting that took place on 7th November 2022. To assess the agreement level, an electronic voting system was used, showing directly the results of the votes on a PowerPoint® presentation during the meeting. The objectives of this voting procedure were not to suppress recommendations nor to add new ones, but to amend recommendations regarding feasibility and wording. The recommendations are part of a lay summary in Dutch and French that is published as a separate document from the scientific report.

3 INTERPROFESSIONAL COLLABORATION DURING ANTENATAL FOLLOW-UP

3.1 Barriers and facilitators to interprofessional collaboration: an explorative review

3.1.1 Definition of interprofessional collaboration

The Oxford English Dictionary defines 'to collaborate' as 'to labor together in an intellectual endeavor'. Scientific authors have tried to define interprofessional collaboration, touching on key factors of or requirements for this collaboration. For example, according to Thomson et al. collaboration *'is a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; involving shared norms and mutually beneficial interaction'*.²⁰ Bedwell et al. defined collaboration as *'an evolving process whereby two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal'*.²¹ and D'Amour et al identified 5 underlying concepts to define the concept of collaboration: sharing, partnership, interdependence, power and process.²² There is a difference between collaboration and other similar concepts such as teamwork and cooperation, although these concepts have also been used interchangeably in literature.²¹ The main difference between collaboration and teamwork lies at the level of analysis, since teamwork involves only individuals within one team, whereas collaboration can occur between individuals, groups, units or a cross-level combination of them. Cooperation, on the other hand, was defined by Bedwell et al. as an attitudinal construct that helps to facilitate the process of collaboration, a predisposition held by the involved parties to be concerned about the overall collaborative goals rather than their own individual goal and it does not imply any reciprocal interaction.²¹



In many countries including Belgium, collaboration is high on the healthcare policy agenda. Effective collaboration between professional groups is increasingly seen as an essential element in safe and good quality health care.²³ It can increase access to care, while maintaining the quality of care with improved efficiency and fewer costs.²⁴ Multidisciplinary collaboration is also seen as a component of integrated care. More information on integrated care in Belgium can be found in the KCE report 359.²⁵ An extensive amount of work on collaboration in health care in general and in perinatal care specifically exists in the literature. In perinatal care, interprofessional collaboration involves nurses, midwives, and physicians (including GPs and obstetricians-gynaecologists) and is especially important for women who cross boundaries from having low-risk pregnancy to high-risk pregnancy.²³

This chapter aims to provide a framework for collaboration to support the analysis of the online survey regarding the current practice of referral between primary care providers and secondary care providers during antenatal follow-up. Therefore, we were interested to know which factors influence interprofessional collaboration in perinatal care identifying which ones are known barriers or facilitators to provide safe, efficient, timely, equitable and patient-centered antenatal care. Although context and reasons for interprofessional collaboration can differ between countries, concepts identifying barriers and facilitators were found to be similar in the international literature. No formal international comparison was done.

3.1.2 Methods

A narrative literature review was performed to identify barriers and facilitators for interprofessional collaboration in antenatal care between physicians and midwives in order to provide safe, efficient, timely, equitable, and -patient centered care. Because we feared the topic antenatal care would be too restrictive, we changed this into perinatal care. The Medline, CINAHL, Embase, EBSCOhost, and Cochrane databases were searched using the keywords 'collaboration'; 'interprofessional', 'perinatal care' and 'barriers', or 'facilitators'. Detailed search strategies are provided in appendix. Only publications in English, French and Dutch, dealing explicitly

with determinants of interprofessional collaboration were retained and we focused primarily on the collaboration between midwives and physicians (GPs and gynaecologists) in antenatal care. Both empirical studies and literature reviews were considered for inclusion, whereas other publication types like editorials and letters were excluded. A summary of inclusion and exclusion criteria can be found in Table 1. Additional publications were selected using the reference lists from the initially identified papers using the snowballing technique. Thematic analysis was performed on the selection of papers. Coding was performed bottom-up using open codes and was followed by categorization. We finished by analyzing the interrelations between the themes.

Table 1 – Inclusion and exclusion criteria for selection of evidence related to interprofessional collaboration

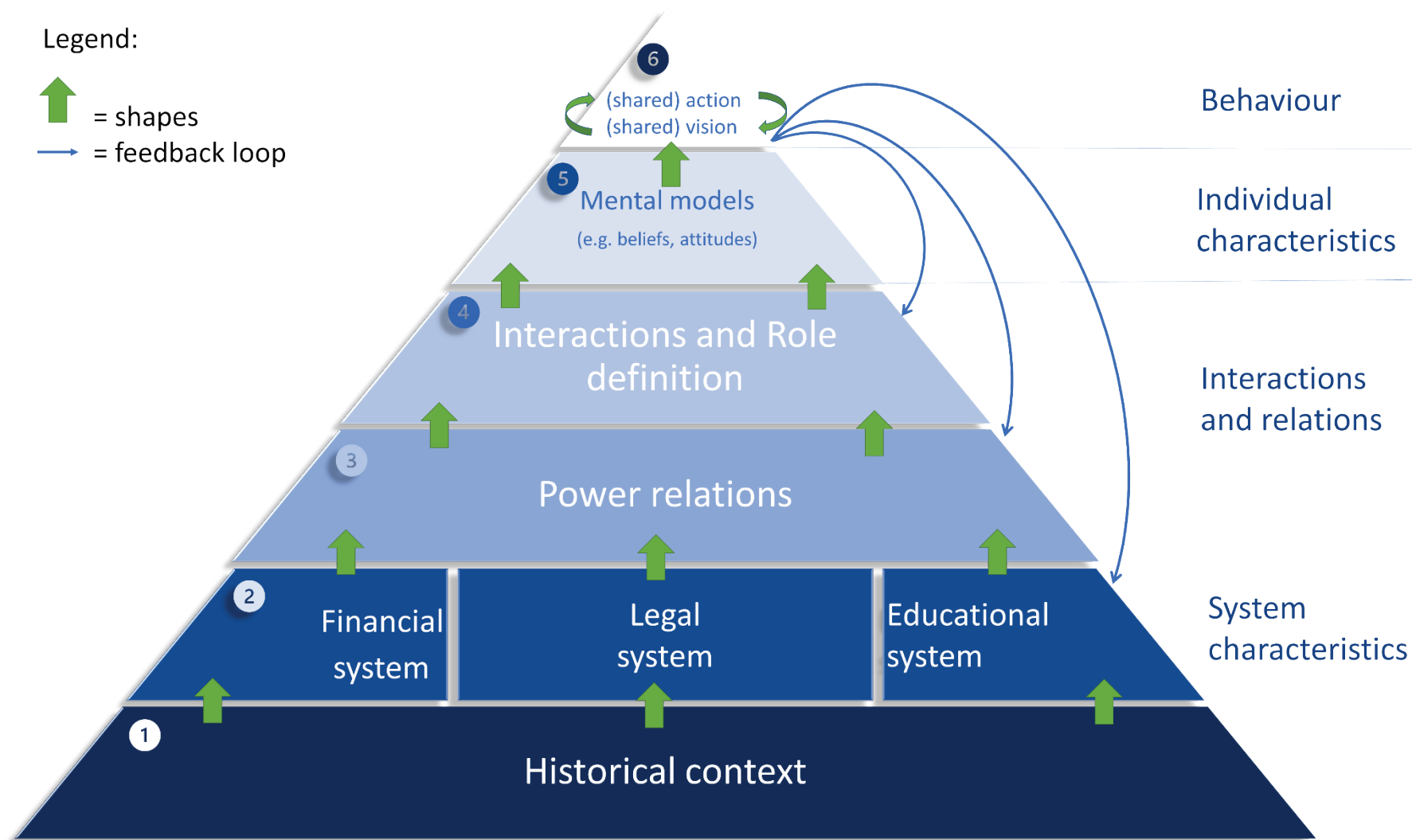
	Inclusion criteria	Exclusion criteria
Patients	Pregnant women	Non-pregnant patients
Intervention	Interprofessional collaboration during perinatal care	Interprofessional collaboration during other care
Comparator	Primary care and specialist care provided by gynaecologists, GPs and midwives	Care provided by non-health professional
Studies	Studies publishes in English, French and Dutch All type of study designs	Other languages

3.1.3 Results

The concepts identified as determinants (barriers or facilitators) of interprofessional collaboration could be classified into 6 levels that interact with each other and represented in a pyramid-like model (Figure 3).



Figure 3 – Classification framework of barriers and facilitators of interprofessional collaboration determinants





The concepts in lower levels influence the concepts above, finally resulting in behaviour - i.e. shared action or interprofessional collaboration - at the top. At the bottom, determining all other levels, is the historical context (level 1). The history of professions shapes the system of today, which is characterized by a distribution of means (financial system), a distribution of responsibility (accountability or legal system) and a distribution of knowledge being passed from one generation to the next through the educational system (level 2). These three system characteristics shape the existing power relations (level 3), which are actually at the heart of the whole dynamic. The power relations determine interaction patterns, and the way roles are defined (level 4) and the interaction patterns in turn determine our mental models (level 5). Mental models are defined as "images, assumptions and stories, which we carry in our minds of ourselves, other people, institutions, and every aspect of the world. Like a pane of glass framing and subtly distorting our vision, they determine what we see".²⁶ Mental models determine not only what we see, but also how we act: our behaviour (level 6), arriving at the top of the pyramid. Additionally, behaviour can change the interaction patterns, power relations, and system characteristics.

3.1.3.1 Historical context (level 1)

Historical tensions between groups of healthcare professionals influence collaborative initiatives.²⁷ Old professionalism is characterized by hierarchical relations between nurses and social workers on the one hand and medicine on the other hand and resulted in oppositional models of decision, work style, roles and accountabilities.²⁸ The term '**silo-effect**' refers to the residue of 'old professional' work habits and communication patterns. The silo-effect can refer to several barriers to collaborative care, like divergent philosophies and competition,²⁸ but also lack of communication and cross-professional support.²⁹ Professional training

occurs within different silos and without guidance or experience in working collaboratively with other healthcare professionals. In that way students are only taught the unique professional values of their respective disciplines.³⁰ Moreover, although obstetricians and midwives share the same patient population and the same goal, they are united in separate professional societies and strive to preserve autonomy in professional practice.³¹

The differences in professional philosophy, including autonomy, professional territory, and work style often lead to conflict situations.³² A major philosophical difference mostly between physicians and midwives, but also within the same profession³³, is the controversy between interventionism and non-interventionism.^{29, 32-34} Historically, childbirth was supported at home by apprentice-trained women. Moving childbirth into hospitals resulted in a dramatic reduction in maternal mortality because of the access to life-saving interventions such as medications to prevent excessive bleeding, sterile conditions and caesarean sections. Additionally, the increased technical possibilities lead to the medicalization^d of childbirth with potential unnecessary interventions or interventions with unclear benefits.³⁶ The formalization of a collaboration between midwives and obstetricians has introduced regulations restricting midwifery practice to the physiological process of pregnancy and delivery without any usage of instruments or medication, and resulted in the obstetrician acquiring a supervising position over midwives.³¹ In order to professionalize (hence differentiate from physicians), midwives took the role of guardians of 'natural' birth.²⁸

This midwives versus gynecologist narrative is criticised in the literature for not capturing the heterogeneity within professions regarding topics such as risk assessment. In other words, opposing views do not necessarily coincide with professional boundaries³⁷. In addition, professions reposition themselves in response to contextual change (e.g. new technologies, new

^d Medicalization means that daily life becomes increasingly defined in terms of health and illness, hence incorporating a growing number of life domains and social problems.³⁵



financing mechanisms).³⁸ The old professionalism and the silo discourse seem to ignore these complexities.

3.1.3.2 System characteristics (level 2)

The historical context shapes the system characteristics, including the distribution of means or the financial system, the distribution of responsibilities or accountability situated within the legal system and the distribution of knowledge reflecting the educational system. Within these system characteristics, several barriers and facilitators could be identified.

Distribution of means

The availability of resources in general, can be a characteristic of effective interprofessional collaboration.²³ A strong financial base was also mentioned by Lane et al. as a minimal requirement for collaboration.²⁸ Besides financial resources, time and infrastructure are also needed, for example for training and incorporating midwives in multidisciplinary teams.³²

Existing financing systems, like fee-for-service, pose an important barrier to collaboration, especially in case of limited resources and/or a small patient caseload, which can lead to competition.³⁹ Moreover, inequities in payment for the same service between physicians and midwives can lead to conflict and 'territorialism'.^{32, 39} Similar financial rewards and advantages are preferable to stimulate collaboration.⁴⁰ Different financing systems can also render it difficult to combine funding in a shared salary pool. However, an appropriate financing system can encourage interprofessional collaboration and remove competition.^{24, 39, 41}

Distribution of responsibilities (accountability)

Asymmetric accountability is described as a barrier to interprofessional collaboration. Often the obstetrician perceives that he/she is the only one held responsible and carries a greater burden of litigation.^{29, 42} Fear of litigation is a common theme across all decisions in maternity care and fear influences the way we act.⁴³ However, also midwives fear litigation. By way of illustration, during a qualitative study including in-depth interviews a midwife manager of a middle-range private hospital stated that *'fear of*

litigation makes everyone interventionist'. According to the interviewed obstetricians in the same study, legal liability lies at the heart of different professional identities and role boundaries.²⁸ Moreover, sharing responsibility and accountability is essential for successful interprofessional collaboration.²⁴

Distribution of knowledge or educational system

According to King et al. interprofessional interaction during educational preparation is a no-brainer for successful collaboration in practice.³⁰ Innovative interprofessional courses for midwifery and medical students, teaching them to communicate and collaborate, may produce a generation of clinicians trained to work in healthcare teams that are rapidly becoming the standard structure for the delivery of healthcare services.³⁰ Redesigning the way healthcare professionals are trained, emphasizing evidence-based practice, and providing more opportunities for interdisciplinary training was proposed in the US by the institute of medicine (IOM) in order to achieve higher quality of care through collaboration.⁴¹ From analysis of 12 papers selected by the American College of Gynaecologists and American College of nurse-midwives (ACOG-ACNM) project, describing successful collaborative practice models between obstetricians and midwives, the authors concluded *'Where education occurred in an interprofessional setting, residents valued midwifery teachers for their approach to normal birth and supportive teaching style'*. An example of interprofessional education in maternity care is hosted several times a year by the Drexel University (Philadelphia, USA) Obstetrics/gynaecology department and consists of transdisciplinary simulation training for midwives, nurse practitioners, obstetric residents, undergraduate medical and nursing students, physician assistants, anaesthesia residents, and nurse anaesthesia students. They work together, as an integrated team, on cases including shoulder dystocia, amniotic fluid embolism, and postpartum haemorrhage cases, so that they learn to practice together and improve the quality of care provided to women.⁴¹



3.1.3.3 Power relations (level 3)

Power is a key concept in interprofessional collaboration. Social status characteristics are a source of power differences that may exist between professionals in a team. For example power differences can be based on gender stereotypes or disparate social status among the professionals in a health care team.⁴⁴ A collegial atmosphere where nurses are considered equal partners with physicians is critical if collaborative relationships are to be established.^{44, 45} Hierarchical structures and imbalance or misuse of power hinder the independence of one group and thereby limit the potential for collaboration in health care in general as well as in perinatal care.^{22, 24} In the context of perinatal care, a successful collaborative system should support an equal level of authority from involved disciplines, by promoting horizontal relationships.^{24, 29, 31, 34, 43, 46} Interprofessional collaboration will benefit when responsibilities and power are shared.^{23, 24, 34, 43}

In order to balance power, integration of the different partners of the collaboration is necessary at all levels: from clinical care to representation in the government.³² Power balance can be achieved by installing non-hierarchical structures, by rotating leadership and by decision making by consensus.^{24, 29, 40, 47} Building vertical relations, stimulating connectivity, or service integration can be achieved by participation in formal and informal teambuilding activities^{39, 43} and easy opportunities for natural dialogue between doctors and midwives.⁴⁸ Cronie et al. suggested the organization of perinatal audit in midwifery consortia, consisting of gynaecologists, midwives, paediatricians, nurses, GPs, pathologists and clinical geneticists to improve collaboration while creating opportunities for exchange.⁴⁹ Rules that allow collegial discussions and disagreements on clinical practice matters led to comfort, an ability to communicate openly, and the opportunity to learn from each other.⁴⁰ Closely linked to this is the importance of an **effective system for conflict resolution**,²³ for example, a no blame

incident analysis⁴⁹ or a structured conflict (open, direct conflict in a safe environment)⁴⁰.

Based on an American qualitative study, Miller et al. remarked that traditional power differentials between nurse and physician were often detrimental to collaborative relationships and suggested that physicians had to learn to share power and the nurse-midwife had to give up ownership of the higher moral ground and the lingering mentality of the oppressed and disempowered.⁴⁰

3.1.3.4 Interactions and role definition (level 4)

Elements of successful collaboration at the interactional level include open communication,^{23, 24, 31, 40, 43, 47} reciprocity and synergy,^{23, 24, 29, 31, 39-41, 43, 47, 49} and role definitions.^{23, 24, 29, 31, 39-41, 43, 47, 49}

A part from 'open', good interprofessional communication has also been characterized as 'honest'^{23, 43}, 'structured'^{31, 49}, 'skilled',⁴¹ 'effective',^{24, 36, 46, 50} 'regular',^{24, 40} 'frequent, ongoing and emphasized',²⁴ and 'reciprocal and enhanced'.²⁹ The sharing of information can be conducted through a variety of mechanisms, from meetings to verbal messages and written documentation like reports and medical documents.²⁴

Reciprocal relationships foster the trust that is essential for successful interprofessional collaboration by sharing responsibility and accountability.²⁴ Reciprocal consultation, sharing of possible changes and difficulties in practice, is a functional component of working together and can lead to the development of consensual guidelines, improving the quality of care.^{31, 41} Multidisciplinary handover meetings and regular clinical reviews can be rituals of reciprocity, recognizing the value of the distinctive knowledge and professional skills of the other and encouraging both professional teams to learn from each other.⁴⁷ The partnership of interprofessional collaboration is

^e Effective communication = the process of exchanging ideas, thoughts, opinions, knowledge, and data so that the message is received and understood with clarity and purpose. When we communicate effectively, both the sender and receiver feel satisfied. <https://theinvestorsbook.com/effective-communication.html>



also characterized by **synergy**. A professionally and personally enabling environment that reinforces the relationships between the partners, so that goals are easier achieved when working together. In such case, one plus one equals much more than two.^{24, 39, 40}

Role definitions articulate clear and respected professional boundaries and are reported to be a key element for successful interprofessional collaboration,²³ whereas role ambiguity is mentioned to stand in the way of optimizing collaboration.⁴⁹ Understanding what the other can do and is expected to do, can mitigate misunderstanding and conflicts. Lack of clarity around roles and responsibilities can lead to the feeling that one's role is superfluous.³⁹ Guidelines can help to clarify professional boundaries between the different professions and standardize the provided care.³¹ **Formalization of collaboration can also be achieved with protocols, care processes, pathways, procedures,^{24, 29, 31, 41} or a detailed practice agreement.⁵¹ Shared guiding principles can help define a shared vision as an integral part of collaboration.²⁴ Moreover, guidelines help to clarify professional boundaries between the different professions.³¹**

3.1.3.5 Mental models (level 5)

The previously mentioned interactional ground rules will help to understand each other's professional and individual strengths and weaknesses and will eventually lead to different attitudes and behaviour toward each other⁴⁰. The **lack of understanding** of each other's values, levels of skill, competence, and scope of the profession can cause misunderstandings, suspicions, myths, and prejudgments^{32, 34, 43, 47}, distorting vision and hindering collaboration.

Mutual respect and trust are key in the true 'partnership' that is interprofessional collaboration^{23, 29, 31, 39-41, 43, 51}. It consists of belief in the ability and reliability of another on the one hand and on the appreciation or regard for what each professional contributes to the partnership, valuing each perspective on the other hand²⁴.

Differing philosophies are understood and excepted.⁵¹ When there is mutual trust and respect, colleagues can support each other and be each other's back-up.^{29, 34, 49} The partners can rely on each other and accept their

interdependence.^{23, 28, 43} Trusting relationships lead to successful outcomes (good patient care, financial rewards, provider satisfaction) and successful outcomes lead to increased trust, in a continuously reinforcing positive spiral.³⁹

Earlier **experiences**, good and bad, will shape the future.⁴⁰ An individual **positive attitude**²³ and **willingness to collaborate**³¹ will improve interprofessional collaboration. A part from personal experiences, a certain degree of individual **trust and competence** are necessary for successful collaborative functioning as they are the foundation of trusting relationships.^{40, 41, 43, 47} The success of the interprofessional collaboration is dependent on the **commitment** to work together and the dedication of each partner to make the partnership work and to succeed despite obstacles. Commitment is reflective of a belief about the importance of the relationship, a feeling that the effort put in is worthwhile.^{24, 41} The participants have to be committed on the one hand to a common goal and on the other hand the interdisciplinary collaborative practice as a way to deliver that care.⁴⁰

3.1.3.6 Behaviour: interprofessional collaboration (level 6)

At the top of the pyramid is the behaviour or interprofessional collaboration itself in which shared visions lead to shared actions and shared actions reinforce the shared vision. A shared vision is defined by common goals, common philosophy, and shared guiding principles as key elements in the collaborative practice.²⁴

The common goal of collaboration (in general or in perinatal care) is in literature frequently articulated as patient-/women-/client-centeredness, or better/superior/safe patient care.^{40, 41, 43, 46, 47} Practice guidelines are made for specific care situations, rather than for specific care providers because high-quality and appropriate care was provided at the point where midwifery philosophy and medical models intersect.⁴¹ The ultimate aim of the collaboration is to integrate services at the point of delivery.³²



3.1.4 Discussion

Effective collaboration depends on many factors at individual, relational/interactional and systemic levels that interact with each other and can be represented in a pyramid-like model. A supportive context includes a non-hierarchical structure with a shared goal (high-quality care for pregnant women) and shared interests with a financing system reducing competition and dealing with accountability issues (sharing responsibilities). However, this stands in contrast to the historical context characterized by a silo-effect and old professionalism. Partners come with their own experiences, competences, and level of trust and their attitudes don't change overnight. They need to be willing to collaborate and believe that it is worthwhile to do so. Procedural elements within the interactional level are the most amenable to change, but even then, it takes time and effort to develop necessary guidelines and rules, that can support relational changes, leading eventually to a true partnership characterized by mutual trust, respect, and synergy. Open communication, decision-making by consensus, and effective conflict resolution is hard work, it needs a willing and committed partner and training.

In order to build the necessary trust for collaboration, health care professionals need to get to know each other and let go of their prejudgments. There is a need for openness toward each other, a willingness to discuss everything with each other as equal partners. Interventions to enhance interprofessional collaboration should be directed first at changing organisational structures and policies to promote easy opportunities for natural dialogue between doctors and midwives⁴⁸. However, minor interventions are unlikely to have a transformative impact. Van der Lee et al suggest disruptive changes like government-driven fusion of professional societies, insurance-driven financial structures, financial partnership, and common protocols and procedures³¹. Adjusting the financing system is an ongoing process in many healthcare disciplines/systems and is highly advisable to stimulate multidisciplinary and collaboration. As the different and separate training of midwives and physicians is an important element hindering collaboration, interprofessional education enabling partners to meet each other and learn from each other, can stimulate interprofessional collaboration. In this context, obstetricians and midwives are confronted both with low and high-risk situations and learn

who can do what in each situation. The different philosophies need to be reconciled into one congruent philosophy. In this way the new professionalism can grow: a partnership model of care with a relationship characterized by communication, exchange, trust, reciprocity, and integrity, where the woman is in the centre of the care and must be involved when negotiating a desired outcome.^{28, 40}

In this literature review, we focused on the interprofessional collaboration between midwives and gynaecologists, however we came across literature on interprofessional collaboration within healthcare teams in general between nurses and physicians. Largely similar determinants were identified there. The level of autonomy can somehow be different between nurses or midwives working in hospital on one side and clinical nurse specialists or independent midwives on the other side, since this last group have certain tasks, they can perform independently. In Belgium, a large group of midwives works in hospital and only a small group works as independent midwives. In the interviews performed for this report, the gynaecologists, physicians and midwives expressed similar barriers and facilitators for interprofessional collaboration.

We did not perform a full, systematic review, so it is possible that we missed certain important publications or overlooked certain concepts as determinants of interprofessional collaboration. However, looking also at the results of the interviews we performed, we strongly feel that additional concepts will probably have a link with the central concepts we found already. Additionally, the selected observational studies include often only a small number of participants, and the selection procedure is not always clearly defined, leading to a possible selection bias in the results.



3.1.5 Conclusion

Many factors can be identified as barriers or facilitators of interprofessional collaboration. They are situated on systemic, relational/interactional, and individual levels and interact with each other. To build the necessary mutual trust and respect which enables collaboration, efforts need to be made first and foremost on the systemic level (educational, legal and financial system) before changes at the interactional level can be envisaged. Change at the top of the pyramid requires a bottom-up approach starting at the base of the pyramid and mounting via interactions and relations towards mental models and finally behaviour.

3.2 Current practice in collaboration between midwives and gynaecologists during antenatal follow-up

3.2.1 Introduction

The current practice of collaboration between midwives and gynaecologists during antenatal follow-up was assessed using an online questionnaire. The data collection took place during the releasing of lock-down measures due to the second wave of the COVID-19 pandemic. Therefore in-dept interviews were not possible at that time.

In this chapter, the experiences and opinions of the midwives and gynaecologists who participated in the online survey are reported.

3.2.2 Method

3.2.2.1 Data collection

To identify the types of collaboration midwives and gynaecologists put in practice and the risk selection methods currently used, an online survey was developed based on explorative interviews with gynaecologists and midwives. As we wanted to reach a large sample of midwives and gynaecologists, we have chosen an online survey as data collection method. Interested readers find the questionnaire in the appendix.

The following topics were surveyed:

- Organisation of pregnancy follow-up
- Collaboration between midwives, gynaecologists, and hospitals
 - Professional network
 - Barriers and facilitators
- Medical and non-medical risk selection

The survey was developed and carried out with Limesurvey® and included both multiple-choice and open questions.

3.2.2.2 Recruitment of participants

To reach a large number of healthcare professionals, we asked the professional organisations of gynaecologists, and midwives to spread the survey among their members. The survey could be filled in between 13th April and 16th May 2021.

3.2.2.3 Data analysis

The quantitative analysis was limited to descriptive statistics, such as frequency tables of the multiple-choice variables. The number of respondents varies between questions because questions were not compulsory. In addition, for some questions more than one answer could be selected. We have no information regarding the representativeness of the respondents against the population of care providers implicated in the antenatal follow-up. Therefore, no statistical inference of the results is proposed.

The entries in reply to the open questions of the survey were analysed by means of qualitative research methods, more specifically a thematic analysis using Nvivo® software was performed. A thematic analysis consists of tagging text fragments with similar content with the same thematic label. In a next step, these themes are clustered into larger categories. The coding was carried out by one researcher, hence no investigator triangulation⁵² has been done. This can be considered a limitation of our research. The data consists of plain text answers to open questions asking respondents to

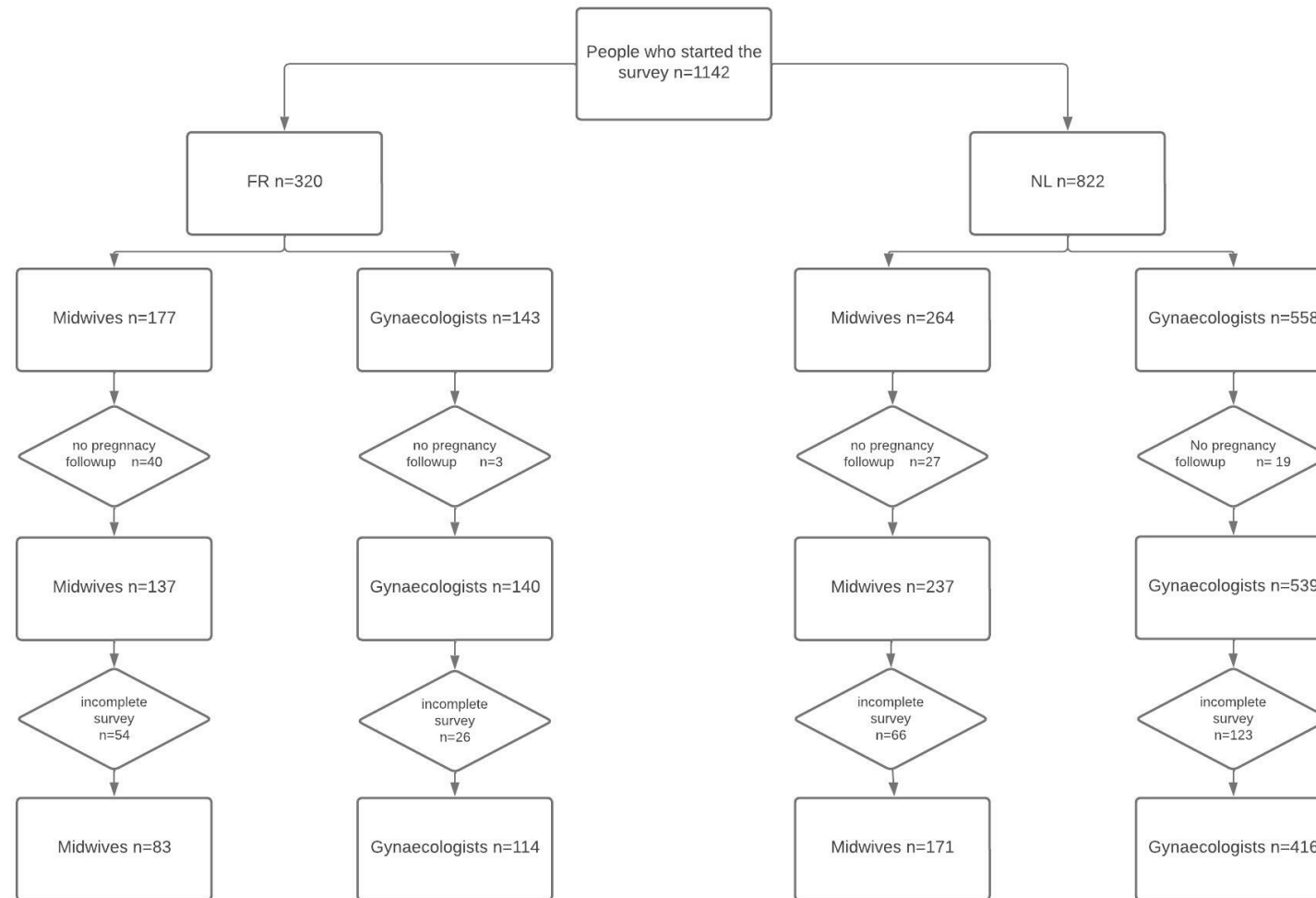


motivate their answer to a closed question. Answers were sufficiently rich to carry out thematic analysis. In addition, the thematic analysis of the responses to the open questions took into account the answer to the preceding closed question. Also we did separate analyses for the input of gynaecologists and midwives. In the result section, we described the emerging thematic categories and visualised the connections between these categories in figures using KUMU®.

3.2.3 Results

3.2.3.1 Participants' characteristics

Among the 1 142 gynaecologists and midwives who logged on to the survey, 89 declared not to practice antenatal follow-up and were excluded from the analysis; 269 forms were not fully filled-in and were also excluded from the analysis. The total of analysed forms was 784. Among these 254 (32%) were midwives and 530 (68%) were gynaecologists, 197 (25%) were French-speaking and 587 (75%) Dutch speaking (see Figure 4). The participation rate can be estimated based on the ratio between the number of survey participants and the number of affiliates in each professional organisation. The participation was 8, 9, 27 and 86% for respectively French-speaking midwives, Dutch-speaking midwives, French-speaking gynaecologists and Dutch-speaking gynaecologists. These are based on the assumption that all members of the professional associations are actively providing antenatal care. However, this is not the case. and the percentage of professionals actively providing antenatal care is unknown. This means that these percentages are an underestimation of the response rate, especially for midwives.

**Figure 4 – Flow chart showing the inclusion of respondents in data analysis**



Place of antenatal care

As mentioned previously (see section 1.1.1), locations where antenatal care takes place are hospital settings and private practices. As shown in Table 1, nine out of ten gynaecologists participating in the survey practised antenatal follow-up at a hospital. Half of them combined hospital and private practice. Exclusive private practices were slightly more frequent in the French-speaking subsample. In contrast, six out of ten midwives participating in the survey practised antenatal follow-up in a private practice. Few of them (13%) combined their work in a private practice with a job in a hospital setting. Only

slightly less than one-third of the surveyed midwives provided antenatal care exclusively in a hospital setting.

Among participants who reported another place for providing antenatal care, 1 gynaecologist worked in the Netherlands, 3 gynaecologists were retired, 1 midwife was a teacher, 1 midwife worked in a medical healthcare centre, 2 midwives worked for Opgroeien (agency for prevention and support for young children and their parents in Flanders)^f and 9 midwives provided home care.

Table 2 – Place of antenatal care delivery by professions

	Gynaecologists [n (%)]			Midwives [n (%)]		
	French-speaking	Dutch-speaking	Belgium	French-speaking	Dutch-speaking	Belgium
Hospital	44 (39%)	197 (47%)	241 (45%)	42 (51%)	38 (22%)	80 (31%)
Private practice	11 (10%)	27 (7%)	38 (7%)	29 (35%)	98 (57%)	127 (50%)
Hospital and private practice	59 (52%)	188 (45%)	247 (47%)	10 (12%)	22 (13%)	32 (13%)
Other		4 (1%)	4 (1%)	2 (2%)	13 (8%)	15 (6%)
Total	114	416	530	83	171	254

When midwives worked at a hospital, they were mainly salaried (92%, 81% and 86%, respectively for French-speaking midwives, Dutch-speaking midwives and the total for Belgium), less frequently they were independent midwives (2%, 3% and 3%, respectively for French-speaking midwives, Dutch-speaking midwives and the total for Belgium) or mixed both statuses (6%, 15% and 11%, respectively for French-speaking midwives, Dutch-speaking midwives and the total for Belgium).

Midwifery activities

In our sample, 9 out of 10 midwives focused their activities on clinical antenatal follow-up, postpartum care, birth preparation and parenthood education (see Table 3). Half of the surveyed midwives do deliveries autonomously and 1 out of 10 were implicated in perineal rehabilitation. Thirty-three midwives reported activities related to preconception, lactation, psychosocial support, and high-risk pregnancy monitoring at the hospital or team management.

^f Opgroeien is also known as Kind & Gezin (K&G)

**Table 3 – Midwifery activities**

Type of care (n, %)	French-speaking (n=83)	Dutch-speaking (n=171)	Total (n=254)
Clinical follow-up			
antenatal	65 (78%)	153 (89%)	218 (86%)
Birth preparation and parenthood education	61 (73%)	166 (97%)	227 (89%)
Delivery	45 (54%)	85 (50%)	130 (51%)
Postpartum care	67 (81%)	156 (91%)	223 (88%)
Perineal rehabilitation	5 (6%)	21 (12%)	26 (10%)

Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.

3.2.3.2 Risk selection during the antenatal follow-up

Clinical risk selection

Among the respondents, 34% of the gynaecologists and 54% of the midwives reported using a tool for clinical risk selection. This trend is also observed in each language group. It was mainly tools developed at the hospital level except for Dutch-speaking midwives using more frequently tools developed abroad (see Table 4). Among the respondents using a tool for the assessment of the clinical risk, most of them (77%) used only one (79% and 73%, respectively for gynaecologists and midwives). Some gynaecologists reported the use of Belgian professional guidelines (n=5), international guidelines (n=5) or discussions with another gynaecologist (n=3). Gynaecologists also underscored the importance of keeping up to date with current scientific literature. For the screening of preeclampsia, the algorithm from the Fetal Medicine Foundation (FMF) was mentioned. Some midwives reported also the use of Belgian professional guidelines (n=10), international guidelines (n=4) but also physician's advice (n=9) or multidisciplinary concertation (n=5).

Table 4 – Use of tools for clinical risk selection

	Gynaecologists	Midwives
French-speaking professionals (n)*	144	83
Use of a tool (n,%)	40 (35%)	42 (51%)
Developed		
• in the own practice	14 (12%)	26 (31%)
• abroad	7 (6%)	5 (6%)
• by a hospital	25 (22%)	26 (31%)
Dutch-speaking professionals (n)*	416	171
Use of a tool (n,%)	145 (35%)	96 (56%)
Developed		
• in the own practice	39 (9%)	33 (19%)
• abroad	65 (16%)	47 (27%)
• by a hospital	80 (19%)	45 (26%)
All professionals (n)*	530	254
Use of a tool (n,%)	185 (35%)	138 (54%)
Developed		
• in the own practice	53 (10%)	59 (23%)
• abroad	72 (14%)	52 (20%)
• by a hospital	105 (20%)	71 (28%)

* Answering all questions was not mandatory, n represents the number of answers to the specific question whose results are presented in this table

Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.

Psychosocial risk selection

Almost all participants stated that psychosocial risks were assessed during the antenatal follow-up (99% of gynaecologists and 97% of midwives). The same trend was observed in the two linguistic groups (99% of gynaecologists and 98% of midwives, and 99% of gynaecologists and 97% of midwives, respectively for French-speaking professionals and Dutch-speaking professionals).



Eight out of ten (84%) of the midwives performed the psychosocial risk selection themselves, in the case of gynaecologists the percentage was 75%. Differences were observed according to the practitioners' language group (respectively for the proportion of midwives and gynaecologists: French speakers: 75% vs 59%; Dutch speakers: 85% vs 77%). When referring to the psychosocial assessment, a social assistant was mostly chosen by the respondents (n=39) followed by midwives with a specific training (n=36), midwives without a specific training (n=30), gynaecologists (n=23) and to a lesser extent gynaecologists with a specific training (n=8) and finally GPs (n=7).

Six out of ten respondents (56%) evaluated psychosocial risk separately from medical risk. Separated assessment of psychosocial risk from medical risk was more frequent in Dutch-speaking professionals than in French-speaking professionals (63% and 35% respectively for Dutch speakers and French-speakers).

Approximately, half of the respondents used a tool to assess the psychosocial risk whatever the profession or the professional's language (see Table 5). Several tools from the literature were mentioned such as the Alpha tool (antenatal psychosocial health assessment)⁵³, Edinburgh postnatal Depression scale or tools used to screen depression in the general population (Whooley questions⁵⁴ and Generalized Anxiety Disorder).⁵⁵⁻⁵⁷ The foreign tools stemmed mainly from the UK and the Netherlands and to a lesser extent from USA, France, Australia, Spain and Ireland. The tools developed by hospitals consisted mainly in questions asked to fill in the pregnant women's medical file. Finally, Belgian tools referred to the UGent protocol⁵⁸ (n=11), Born in Brussels⁹ (n=8), ONE⁵⁹ (n=12) or a pathway perinatal mental health (n=6). Belgian tools were more often used by midwives than gynaecologists.

Table 5 – Use of tools for psychosocial risk selection

	Gynaecologists	Midwives
French-speaking professionals (n)*	43	23
Use of a tool (n,%)	19 (44%)	13 (57%)
Developed		
• in the international literature	5 (12%)	4 (17%)
• abroad	1 (2%)	0 (0%)
• by a hospital	12 (28%)	9 (39%)
• in Belgium	7 (16%)	7 (30%)
Dutch-speaking professionals (n)*	239	111
Use of a tool (n,%)	124 (52%)	57 (51%)
Developed		
• in the international literature	69(29%)	31 (28%)
• abroad	8 (3.3%)	4 (3.6%)
• by a hospital	75 (32%)	24 (22%)
• in Belgium	17 (7%)	15 (13%)
All professionals (n)*	282	134
Use of a tool (n,%)	143 (51%)	70 (52%)
Developed		
• in the international literature	74 (26%)	35 (26%)
• abroad	9 (3.2%)	4 (3.0%)
• by a hospital	87 (30%)	33 (25%)
• in Belgium	24 (8%)	22 (16%)

* Answering all questions was not mandatory, n represents the number of answers to the specific question whose results are presented in this table

Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.



3.2.3.3 Organisation of the follow-up in low-risk pregnancy

For low-risk pregnancies, approximately half of the gynaecologists advice antenatal follow-up in alternation with a midwife. This finding is observed in both linguistic groups. Seven out of ten midwives also recommended this kind of alternating follow-up, but half of the midwives also recommended a midwifery-led follow-up in which only ultrasounds were performed by a gynaecologist. The latter type of follow-up was more often suggested by French-speaking gynaecologists than by Dutch-speaking gynaecologists (28% vs 9% respectively). In addition, four out of ten gynaecologists proposed a gynaecologist-led follow-up in a context of a low-risk pregnancy. Gynaecologist-led follow-up was rarely proposed by a midwife, especially in the French-speaking subgroup (5 vs 9% respectively for French and Dutch-speaking midwives). Alternating antenatal follow-up with a GP seemed to be occurring uniquely among Dutch-speaking practitioners (see Table 6).

Approximately, one out of ten respondents mentioned that the choice regarding the type of antenatal follow-up was left to the couple. This couple-centered approach was more reported by Dutch-speaking than French-speaking practitioners (9% and 14% respectively for Dutch-speaking gynaecologists and midwives vs 3% and 2% respectively for French-speaking gynaecologists and midwives).

Table 6 – Type of antenatal follow-up in low-risk pregnancy

	Gynaecologists	Midwives
French-speaking professionals (n, %)	114	83
Follow-up performed only by a gynaecologist	50 (44%)	4 (5%)
Follow-up performed only by a midwife except the ultrasounds	32 (28%)	45 (54%)
Follow-up alternating between a gynaecologist and a midwife	62 (54%)	55 (66%)
Follow-up alternating between a gynaecologist and a GP	10 (9%)	0 (0%)
Follow-up alternating between a gynaecologist, a GP and a midwife	0 (0%)	0 (0%)
Dutch-speaking professionals (n, %)	414	171
Follow-up performed only by a gynaecologist	170 (41%)	16 (9%)
Follow-up performed only by a midwife except the ultrasounds	36 (9%)	82 (48%)
Follow-up alternating between a gynaecologist and a midwife	242 (58%)	118 (69%)
Follow-up alternating between a gynaecologist and a GP	247 (60%)	18 (10%)
Follow-up alternating between a gynaecologist, a GP and a midwife	17 (4%)	11 (6%)
All professionals (n, %)	528	254
Follow-up performed only by a gynaecologist	220 (42%)	20 (8%)
Follow-up performed only by a midwife except the ultrasounds	68 (13%)	127 (50%)
Follow-up alternating between a gynaecologist and a midwife	304 (58%)	173 (68%)
Follow-up alternating between a gynaecologist and a GP	257 (49%)	18 (7%)
Follow-up alternating between a gynaecologist, a GP and a midwife	17 (3%)	11 (4%)

* Answering all questions was not mandatory, n represents the number of answers to the specific question whose results are presented in this table

Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.



3.2.3.4 Collaboration during antenatal care

Networking

Almost all respondents (99% of the gynaecologists and 97% of the midwives) can rely on an informal professional network when needed (French-speakers: 98% gynaecologists and 96% midwives, Dutch-speakers: 99% gynaecologists and 98% midwives). The composition of the network is presented in Table 7. Seventy-two per cent of the gynaecologists estimated that their professional network was complete and sufficient for their antenatal practice while it was only the case for 37% of the midwives. Only 4 participants reported including a dietician in their network, 3 reported a lactation consultant, 2 a CPAS/OCMW staff member, 1 a sexologist, 1 a homoeopath and 1 a community nurse. In addition, 10 participants stated that they included in their network charity organisations dedicated to pregnant women especially for the social issues. Mental healthcare professionals are the main missing professionals in both gynaecologists' and midwives' networks (see Table 7). Respondents reported long waiting times, especially for psychologists and psychiatrists specialised in pregnant women's mental health.

** Answering all questions was not mandatory, n represents the number of answers to the specific question whose results are presented in this table
Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.*

Table 7 – Composition of the professional network supporting antenatal care practitioners

	Gynaecologists	Midwives
French-speaking professionals (n, %)	109	78
Midwives	33 (30%)	62 (79%)
Gynaecologists	93 (85%)	74 (95%)
GPs	30 (27%)	28 (36%)
Other medical specialists	100 (92%)	47 (60%)
Mental healthcare professionals	88 (80%)	62 (79%)
Social workers	93 (85%)	54 (69%)
ONE/K&G/Kaleido staff members	9 (8%)	11 (15%)
Physiotherapists or osteopaths	1 (1%)	3 (4%)
Dutch-speaking professionals (n, %)	403	162
Midwives	102 (25%)	108 (67%)
Gynaecologists	319 (79%)	132 (81%)
GPs	173 (43%)	104 (64%)
Other medical specialists	360 (89%)	86 (53%)
Mental health professionals	317 (79%)	123 (76%)
Social workers	322 (80%)	94 (58%)
ONE/K&G/Kaleido staff members	0 (0%)	11 (7%)
Physiotherapists or osteopaths	4 (1%)	6 (4%)
All professionals (n, %)	512	240
Midwives	135 (26%)	170 (71%)
Gynaecologists	412 (80%)	206 (86%)
GPs	203 (40%)	132 (55%)
Other medical specialists	460 (90%)	133 (55%)
Mental healthcare professionals	405 (79%)	185 (77%)
Social workers	415 (81%)	148 (62%)
ONE/K&G/Kaleido staff members	9 (2%)	22 (9%)
Physiotherapists or osteopaths	5 (1%)	9 (4%)



Table 8 – Professions missing in the support network of antenatal care practitioners

	Gynaecologists	Midwives
French-speaking professionals (n)	109	78
Midwives	1 (1%)	10 (13%)
Gynaecologists	3 (3%)	14 (19%)
GPs	4 (4%)	8 (10%)
Other medical specialists	8 (7%)	18 (23%)
Mental healthcare professionals	14 (13%)	16 (20%)
Social workers	8 (7%)	18 (23%)
ONE/K&G/Kaleido staff members	0 (0%)	12 (15%)
Physiotherapists or osteopaths	0 (0%)	1 (1%)
Dutch-speaking professionals (n)	403	162
Midwives	5 (1%)	8 (5%)
Gynaecologists	9 (2%)	24 (15%)
GPs	7 (2%)	14 (9%)
Other medical specialists	22 (6%)	37 (23%)
Mental healthcare professionals	53 (13%)	38 (24%)
Social workers	15 (4%)	25 (15%)
ONE/K&G/Kaleido staff members	0 (0%)	2 (1%)
Physiotherapists or osteopaths	0 (0%)	2 (1%)
All professionals (n)	512	240
Midwives	6 (1%)	18 (7%)
Gynaecologists	12 (2%)	38 (16%)
GPs	11 (2%)	22 (9%)
Other medical specialists	30 (6%)	55 (23%)
Mental healthcare professionals	67 (13%)	54 (23%)
Social workers	23 (4%)	43 (18%)
ONE/K&G/Kaleido staff members	0 (0%)	14 (1%)
Physiotherapists or osteopaths	0 (0%)	3 (1%)

* Answering all questions was not mandatory, n represents the number of answers to the specific question whose results are presented in this table

Remark: As respondents can choose several answers, the answer modalities are not mutually exclusive so the total percentage can exceed 100%.

Collaboration with the hospital sector

Among the midwives participating in the survey, 55 (22%) have signed an agreement with a hospital. Among those, 25 stated that the agreement included a list of indications requiring referral to a gynaecologist.

Collaboration between midwives and gynaecologists: gynaecologists' point of view

Eighty five percent of the gynaecologists participating in our survey reported collaboration with midwives during antenatal follow-up (93% of the French speakers and 82% of the Dutch speakers). When we asked about the role of the midwife within the collaboration, gynaecologists highlighted four main roles:

- Support in the clinical antenatal follow-up according to a prescheduled scheme. The prescheduled scheme varied between respondents. GPs are also sometimes included. The prescheduled schemes included the number of consultations for each care provider and the acts to be performed in each consultation. The task sharing varied according to the pregnant woman's preferences, the work status of the midwife (independent or hospital employee) and the risk level attributed to the pregnancy.
- Parenthood education and birth preparation. These interventions are delivered by midwives in individual or group sessions. The gynaecologists identified the following topics of the sessions:
 - information regarding the pregnancy (the different stages of the pregnancy, prevention of diseases such as toxoplasmosis or CMV, tests during pregnancy (e.g. NIPT), physical activities, practical information and administrative tasks),



- information regarding delivery (the different stages of delivery, visit of the maternity ward and delivery room, pain management, birth plan)
- information regarding postpartum (breastfeeding, preparation of the postpartum at home).
- Monitoring purposes. The monitoring included cardiotocography, blood pressure (in case of suspicion of preeclampsia home visits by a midwife were considered), and blood glucose in the context of preterm birth suspicion or post-term pregnancy.
- Management of the psychosocial issues linked to pregnancy.

The gynaecologists' global satisfaction about the collaborative work with midwives was high, with 9 out of ten being satisfied. However, this rate is higher among French-speaking gynaecologists in comparison to the Dutch-speaking. The majority of gynaecologists was satisfied, and a smaller proportion was very satisfied (see Table 9).

Table 9 – Gynaecologists' satisfaction about the collaborative work with midwives

Satisfaction	French-speaking (n=102)	Dutch-speaking (n=324)	Total (n=426)
Global satisfaction rate	97%	85%	88%
Very satisfied	34%	27%	29%
Mostly satisfied	58%	58%	59%
Global dissatisfaction rate	3%	15%	12%
Mostly unsatisfied	2%	13%	10%
Very unsatisfied	1%	2%	2%

^h Construct validity concerns how well an indicator reflects the concept it is supposed to measure.⁶⁰

The closed question about satisfaction with interprofessional collaboration referred to midwives in general, without specifying subgroups. However, respondents often used the open question to specify a subgroup. Gynaecologists differentiated between midwives with whom they were familiar versus unfamiliar, and between hospital employed and independent midwives. This differentiation was often referred to, to nuance their responses. Comments motivating dissatisfaction were mostly directed to independent midwives and/or midwives with whom they were not familiar. The questions and answer categories in the survey did not allow respondents to specify a subgroup of midwives. The fact that respondents used the open question to nuance their answer, means that the answers to the open question must be interpreted with caution (Table 9). We do not know for which subgroup of midwives, gynaecologists expressed their (dis)satisfaction in the closed question. In other words, the construct validity^h of satisfaction with interprofessional collaboration can be questioned. Therefore the thematic analysis of the open questions is all the more important. The result of this analysis of the gynaecologists' point of view as described in their replies to the open question, is summarised in Figure 5.

The analysis of the open question focused on barriers and facilitators of trust and interprofessional collaboration. The open question was 'Why are you (dis)satisfied?' Both the answers of the satisfied and the dissatisfied participants were analysed. The mentioned barriers were not restricted to dissatisfied participants, just as the facilitators were not limited to satisfied participants. Often gynaecologists reported to be (very) satisfied in general, but unsatisfied in particular situations or in reaction to a subgroup of midwives. By consequence, the thematic analysis described below should be read in the perspective of participants trying to nuance their (dis)satisfaction, specifying situations that cause worry or frustration, without generalising it to "the gynaecologists" and "the midwives". In the description below, we tried to reproduce the nuance through the use of conditional clauses or if-clauses.



In the heart of Figure 5, trust is depicted as the key prerequisite for a satisfying interprofessional collaboration. We will describe facilitators and barriers to have trust on the one hand and facilitators and barriers that are related directly to collaboration on the other hand. The size of the dots represents the number of text fragments that were coded under the facilitator/barrier concerned (except for the blue coloured dots which are analytical concepts referring to outcome variables).

Below we present the facilitators and barriers in detail, starting with the facilitators of **trust**.

Gynaecologists' **trust** in midwives is enabled by a shared vision, smooth communication, clear agreements and knowing each other's way of working. However, **trust is threatened** if gynaecologists perceive a lack of communication, if they experience uncollegial or competitive behaviour, if they encounter anti-medicalisation discourses or disinformation, if they evaluate midwives' abilities to detect medical risks as insufficient, if they worry about the shifting of responsibility and blame to gynaecologists for situations gone bad they have to solve, and if they identify dangerous situations such as late referrals and underestimation or denial of medical risks.

A **shared vision and approach** were mentioned by gynaecologists as a reason for existing successful collaborations. However, the absence of a shared vision was never mentioned as a reason for being dissatisfied. **Communication** on the contrary is a knife that cuts both ways: smooth communication is clearly a precondition for the development of trust and subsequently successful collaboration, but a lack of communication kills collaboration (see next paragraph). **Clear agreements on who does what** was the most commonly cited facilitator. In existing collaborations, a clear role definition was held responsible for their success. Roles are then described as **complementary** and an added value for the pregnant woman or the couple. On the contrary, if agreements are not respected, trust is damaged and collaboration jeopardized. Hence for collaboration to be successful, it should be preceded by a clear agreement on who does what and it can only be maintained if all parties respect that agreement at all times. Finally, trust goes hand-in-hand with **knowing each other** or familiarity with each other's way of working.

Lack of communication was the most frequently mentioned barrier to the development of trust. Gynaecologists mentioned unidirectional communication, a lack of communication means (e.g. shared patient file), and incomplete communication (e.g. not providing the necessary information). Communication is especially important and a source of irritation at the moment of a referral. For example, when midwives refer to a gynaecologist without transferring all the necessary information, or when gynaecologists do not get any feedback after referral to a midwife. In addition to a lack of communication (see previous paragraph) the development of trust is challenged if gynaecologists encounter anti-medicalisation discourses or dangerous situations. With **anti-medicalisation discourses** gynaecologists referred to situations in which they or their way of working is criticised, their advice is contradicted they are accused of being too interventionist, suspicion is created, midwives impose their view, or and give couples too romantic expectations. Some gynaecologists estimated **midwives' medical knowledge and experiences** as too limited to **detect medical risks**. Often this was linked to **insufficient training**. Gynaecologists' trust in midwives was also impeded if they encountered **dangerous situations**. They mentioned midwives referring too late, forgetting crucial acts (e.g. incomplete anamnesis, incomplete blood samples), not working according to evidence-based practices, making mistakes, not being aware of their own limitations, and underestimating medical risks. Gynaecologists worried about being held responsible, if things go wrong, even though the origin of the problem was out of their hands. Finally, **uncollegial or competitive behaviour** was identified as inhibiting the development of trust. It refers to midwives questioning the advice of a gynaecologist, convincing women or couples of a delivery without gynaecologist while they were referred to them by a gynaecologist, or taking patients away from gynaecologists.

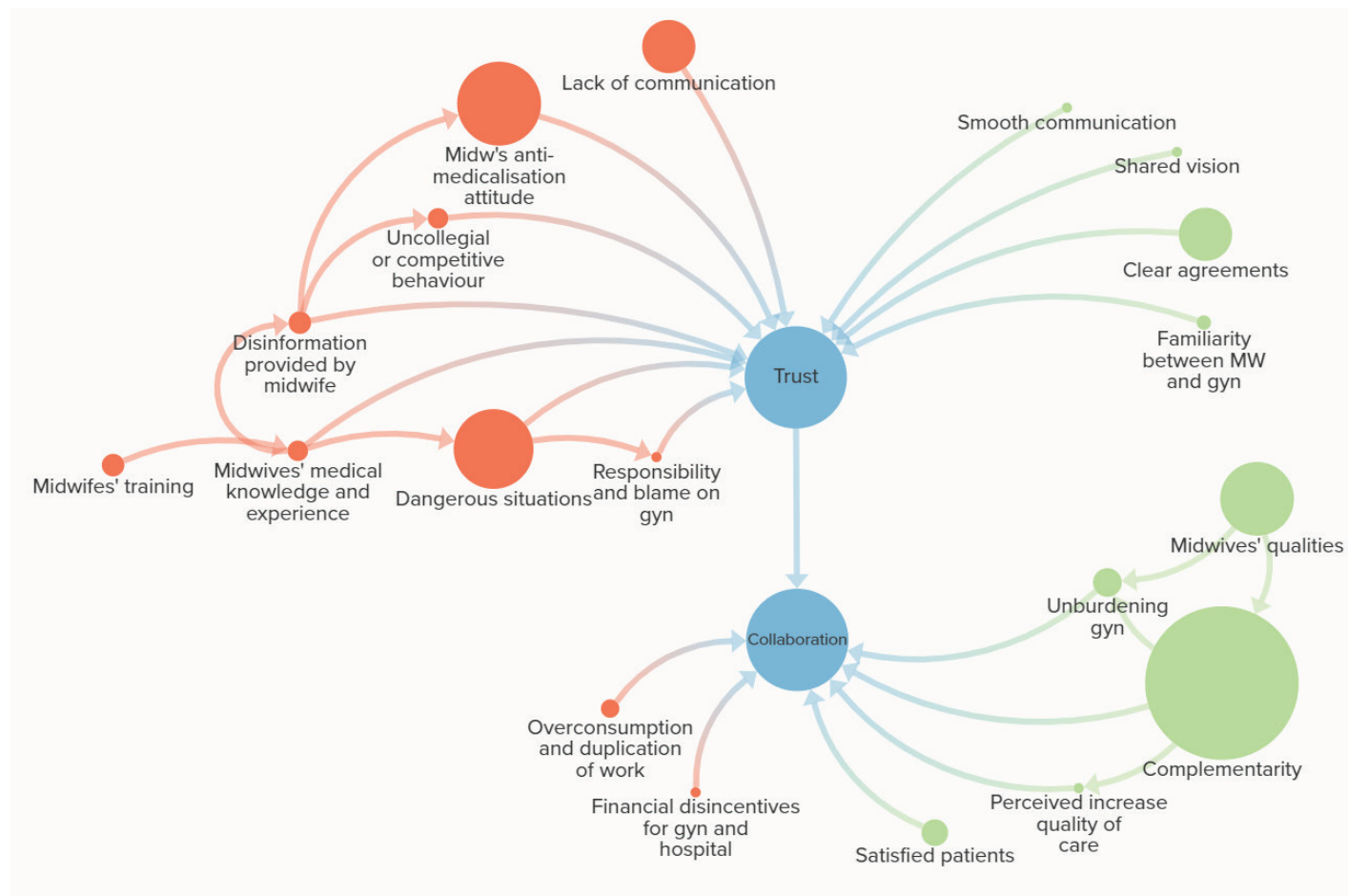
We also identified several facilitators and barriers directly related to successful **interprofessional collaboration**.



Stimulating factors were perceived complementarity of midwives and gynaecologists increasing the quality of care, and women or couples being satisfied. **Complementarity** was linked to the qualities midwives have to offer such as their availability, their accessibility and their ability to listen to couples. In addition, gynaecologists felt unburdened by midwives taking over some tasks.

Inhibiting factors were **overconsumption and duplication of work** and the **financial disincentives** for gynaecologists and hospitals related to more midwifery involvement in antenatal care.

Figure 5 – Facilitators and barriers to the development of trust and interprofessional collaboration between gynaecologists and midwives in antenatal care, from the perspective of gynaecologists





Collaboration between midwives and gynaecologists: midwives' point of view

The midwives' global satisfaction rate during the collaboration with gynaecologists was lower than the satisfaction rate observed in gynaecologists (68% vs 88% respectively). The satisfaction rate is higher in French-speaking midwives in comparison to Dutch-speaking midwives. The majority of midwives were mostly satisfied, and a smaller proportion was very satisfied (see Table 10).

Table 10 – Midwives' satisfaction about their collaboration with gynaecologists

Satisfaction	French-speaking (n=78)	Dutch-speaking (n=162)	Total (n=240)
Global satisfaction rate	80%	62%	68%
Very satisfied	18%	12%	14%
Mostly satisfied	62%	49%	53%
Global dissatisfaction rate	20%	38%	32%
Mostly unsatisfied	19%	27%	26%
Very unsatisfied	1%	6%	6%

When analysing the replies to the open question (n=211, n French-speakers=72, n Dutch-speakers=139) allowing midwives to motivate their answer to the closed question about satisfaction with interprofessional collaboration, midwives also differentiated between gynaecologists, but this was more on an individual basis. Plenty of midwives started their comment with "it depends on the individual gynaecologist". They spoke in a positive way about gynaecologists with whom they are used to work, whom they know, who are practising in the same hospital, or who are young.

The core dynamic emerging from the replies to the open question is more complicated than from the gynaecologists' perspective. In addition to trust being a prerequisite for collaboration, we observed that the **reluctance of midwives to contact a gynaecologist** acted as an intermediary variable.

Midwives who feel reluctant to contact a gynaecologist will not develop trust, nor engage in collaboration. The positive way around, collaboration and trust kill midwives' reluctance to work with gynaecologists. Note that midwives were more focused on barriers in their comments. Facilitators are underrepresented in Figure 6 and were less frequently cited (size of the dots, except for the blue coloured dots which are analytical concepts referring to outcome variables).

Each variable in the core dynamic (trust, reluctance and collaboration) has its own barriers and facilitators.

Let's start with **trust**. Trust in gynaecologists is boosted by **mutual respect, shared vision** and **agreements on who does what**. Mutual respect also included the willingness to listen to a midwife and the absence of judgements related to midwives' competence. Trust is however severely hampered by a lack of communication and of familiarity of gynaecologists with midwives' competencies. **Lack of familiarity with midwives' competencies** referred to gynaecologists not knowing midwives' competencies, nor being aware of midwives' added value. **Lack of communication** refers to too little communication (e.g. too little feedback after referral), missing information (e.g. discharge documents) and the need for a shared digital patient file.

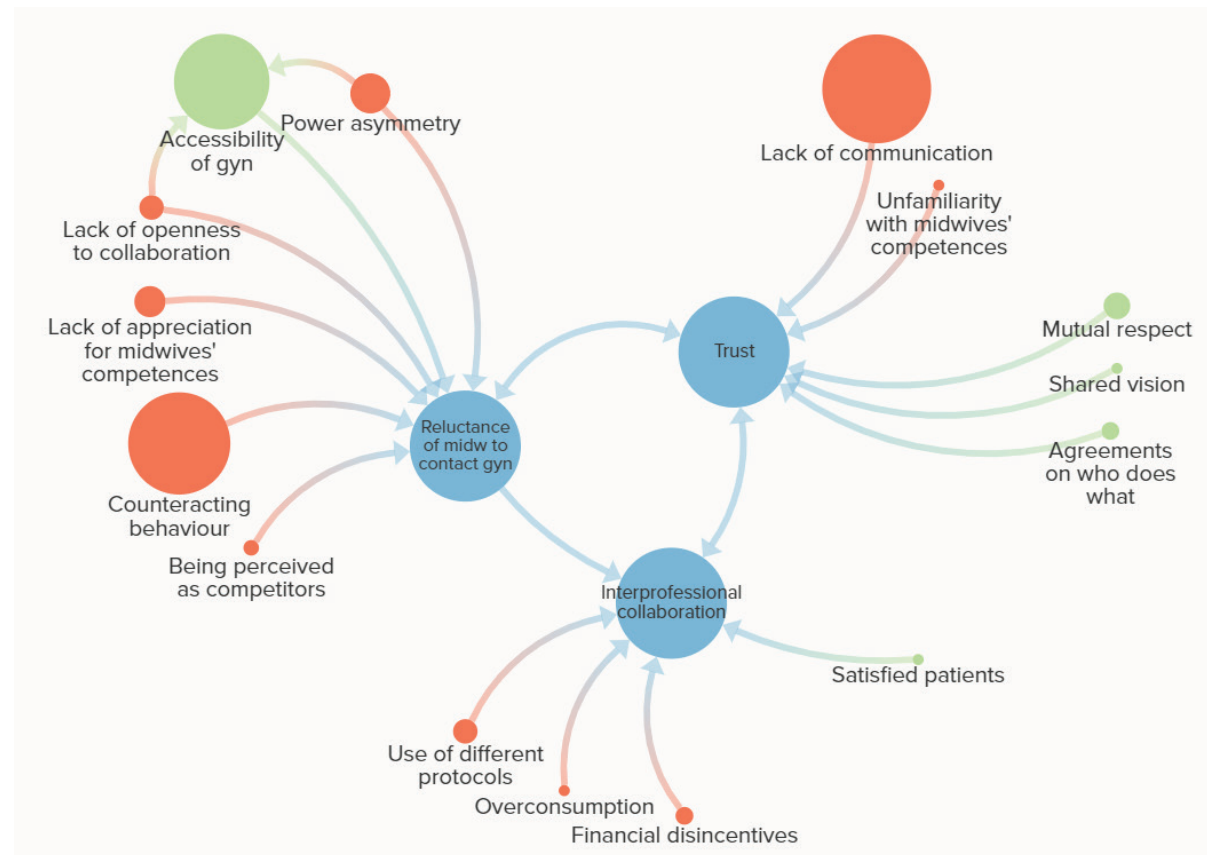
Midwives' statements about **appreciation of midwives' competencies** and **gynaecologists' openness to collaboration** were rather negative, reinforcing their **reluctance to contact a gynaecologist**. Also, **power asymmetry** feeds midwives' reluctance and includes expressions reflecting a hierarchical relationship with gynaecologists. Also, the feeling of not being taken seriously is part of it. **Accessibility** was an important theme for midwives' satisfaction with the collaboration with gynaecologists. Midwives mostly mentioned it to motivate their satisfaction, not so much their dissatisfaction. **Counteracting and competitive behaviour** were cited to explain midwives' reluctance and dissatisfaction. Counteracting behaviour included all kinds of unsupportive or opposing behaviour, such as discouraging couples to consult a midwife, not referring to a midwife, negative reactions if couples ask for an alternative follow-up, not willing to transfer a patient file or other type of information, and disdainful reactions

towards midwives. In addition, midwives reported being perceived as competitors by gynaecologists.

Finally, some more practical inconveniences discouraging interprofessional collaboration were mentioned in midwives' replies: the **use of different**

protocols, financial disincentives and **overconsumption**. **Satisfied patients** on the contrary were cited to motivate satisfaction with interprofessional collaboration.

Figure 6 – Facilitators and barriers to the development of trust and interprofessional collaboration between gynaecologists and midwives in antenatal care from the perspective of midwives



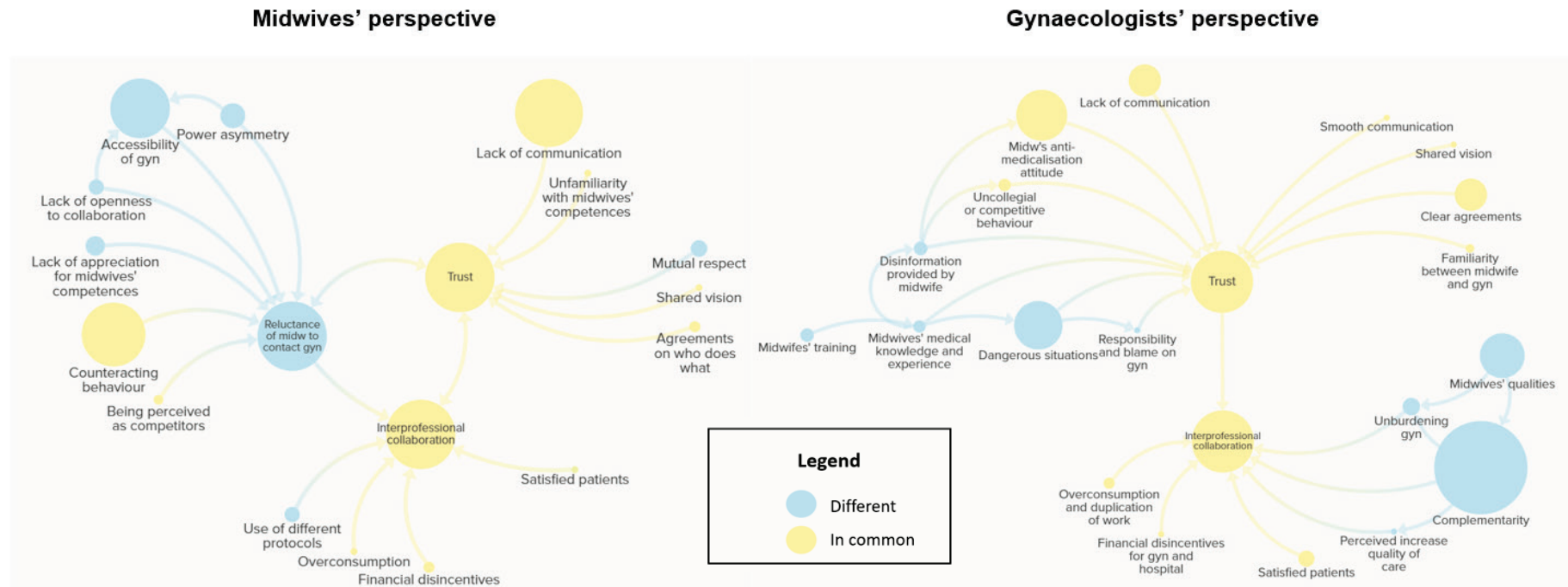


Comparison of barriers and facilitators of interprofessional collaboration as expressed by gynaecologists and midwives

When comparing gynaecologists' and midwives' motivational replies to the question why they were satisfied or dissatisfied with interprofessional collaboration, we identify several common themes. First of all, in the core dynamic, the important role of trust stands out. Common factors reinforcing trust were shared vision and clear agreements on who does what. Both gynaecologists and midwives found communication an important prerequisite to building trust and successfully collaborating. Both especially used a lack of communication to motivate their dissatisfaction. In addition, direct barriers to interprofessional collaboration cited by both gynaecologists and midwives were overconsumption and financial disincentives. Finally, although it was labelled differently, both gynaecologists and midwives pointed to counteracting behaviour as an important cause of their dissatisfaction. From the gynaecologists' perspective, we labelled this midwives' anti-medicalisation attitude, uncollegial and competitive behaviours, while in the midwives' perspective we called it counteracting and competitive behaviour. For gynaecologists, this counteracting behaviour of midwives hampered the development of trusting relationships and therefore discourages collaboration. For midwives, the unsupportive behaviour of gynaecologists reinforced their reluctance to contact a gynaecologist and therefore disables collaboration. Both professions reported a certain degree of disrespect for each other's work and competencies. In addition to this common theme, gynaecologists worried about dangerous situations, which they attribute to a lack of medical knowledge and experience of midwives doing antenatal follow-ups. Their experience with dangerous situations was an important reason to distrust midwives providing antenatal care.



Figure 7 – Comparison between gynaecologists' and midwives' perspectives



Solutions to improve interprofessional collaboration

Although gynaecologists and midwives largely agreed on how to improve interprofessional collaboration, we treated them separately, because the content of the statements grouped together in each category slightly differed. Also, the categories were ranked differently (see Figure 8). The ranking was based on the number of statements that were classified in each category. In other words, highly ranked categories included statements most frequently stated.



Gynaecologists' suggestions for an improved interprofessional collaboration

Gynaecologists most frequently cited **communication and information sharing** as a means to improve interprofessional collaboration. A **shared patient file** as a means of information sharing and improving interprofessional communication was an important theme.

Second, gynaecologists suggested that **working together and sharing experiences** would contribute to interprofessional collaboration. More specifically they mentioned the creation of interprofessional teams, doing consultations together, having interdisciplinary meetings, developing joint care paths, protocols and guidelines, and structural collaboration.

Third, **building a partnership** was proposed. For the definition of partnership, we follow D'Amour et al. (2005, p. 118)²² who state: "*The notion of partnership implies that two or more actors join in a collaborative undertaking that is characterised by a collegial-like relationship that is authentic and constructive.*" In the replies of gynaecologists, the partnership included stopping demonising gynaecologists, stopping seeing each other as competitors, stopping prejudices, but creating mutual respect, less polarisation, and more collegiality.

Fourth, a **clear definition of responsibilities and roles** was put forward by gynaecologists. This included clear referral criteria, appointing gynaecologists as the only professional responsible for risk selection and coordinator in antenatal care, giving midwives accountability and full responsibility, defining criteria for low-risk pregnancies, and the same insurance for midwives and gynaecologists.

Fifth, the **training and competencies of midwives** should be upgraded and improved. More concrete this meant better educating midwives in pathology, obliging midwives to build experience in a hospital setting before becoming an independent midwife, create a transition year from midwifery to nursing educational programs, organise simulation training days for midwives and

gynaecologists, train midwives in evidence-based medicine, and emphasise midwives' responsibilities during their training.

Sixth, the **organisation and regulation of the midwifery profession** should change in several ways. Gynaecologists proposed to train fewer midwives, create more homogeneity in the follow-up between midwives, prohibit midwives from practising in isolation, guarantee continuity of care by the same midwife, create an "midwifery council", define a minimal level of activity (in order to practice skills sufficiently), ask midwives to keep a logbook, list midwives with the same adequate way of working, oblige midwives to work at least part of their time in a hospital, and ban advertisements of midwifery practices.

Seventh, **financial arrangements** have been cited. This referred to the creation of a financial framework beneficial for both gynaecologists and midwives, introduce the same co-payment for gynaecologists and midwives, leave the fee-for-service financing, pay gynaecologists for supervising midwives, increase gynaecologists' remuneration for technical acts, make sure that the involvement of midwives in antenatal care does not imply an income loss for gynaecologists.

Midwives' suggestions for an improved interprofessional collaboration

The suggestions of midwives to improve interprofessional collaboration could be classified in mainly the same categories as those cited by gynaecologists. However, the content grouped together in a category slightly differed.

First, the most frequently cited suggestions from midwives were clustered in the category **partnership**¹. For midwives, partnership means foremost more recognition and respect for, knowledge about, and trust in midwives' and each other's competencies. In addition, they mentioned being able to have open discussions with gynaecologists about specific cases, dropping prejudices, stopping to see each other as competitors and think that

ⁱ For the definition of partnership see paragraph 'Gynaecologists' suggestions for an improved interprofessional collaboration'



midwives want to steal patients, sharing the same goals, avoiding fuelling competition, building mutual respect and appreciation, installing leadership engagement of hospital management and stopping disdainful attitudes or actions towards midwives.

Second, midwives would improve interprofessional collaboration through more **communication and information sharing**. This included the introduction of a shared patient file, more open and informal communication, gynaecologists providing women or couples with neutral information, and better information transfer in case of referral.

Third, the **organisation and regulation of antenatal care** was envisaged. This cluster contained direct access to a gynaecologist if advice is needed, gynaecologists referring to midwives, a first point of contact gynaecologist for each hospital, more uniformity in protocols, less elective interventions by gynaecologists, always involving a midwife in antenatal follow-up, also for high-risk pregnancies, longer gynaecologist consultations, no referrals of high risk women to a midwife, more openness among hospitals for agreements with independent midwives, alternating follow-up becoming standard care, and a coordinating or liaison midwife in each hospital for perinatal care.

Fourth, midwives were in favour of **working together and sharing experiences**. More specifically they mentioned interprofessional meetings to discuss complicated cases, horizontal collaboration between midwives and gynaecologists, debriefing time after joint consultations, informal meetings with gynaecologists, constructive collaboration between professional organisations, a tool to identify risks, and joint protocols.

Fifth, the **definition of responsibilities and roles** was referred to by midwives. This included statements such as midwives should be the responsible care giver for all low-risk pregnancies, professionals' roles

should be clearly defined, and midwives should be allowed to prescribe more.

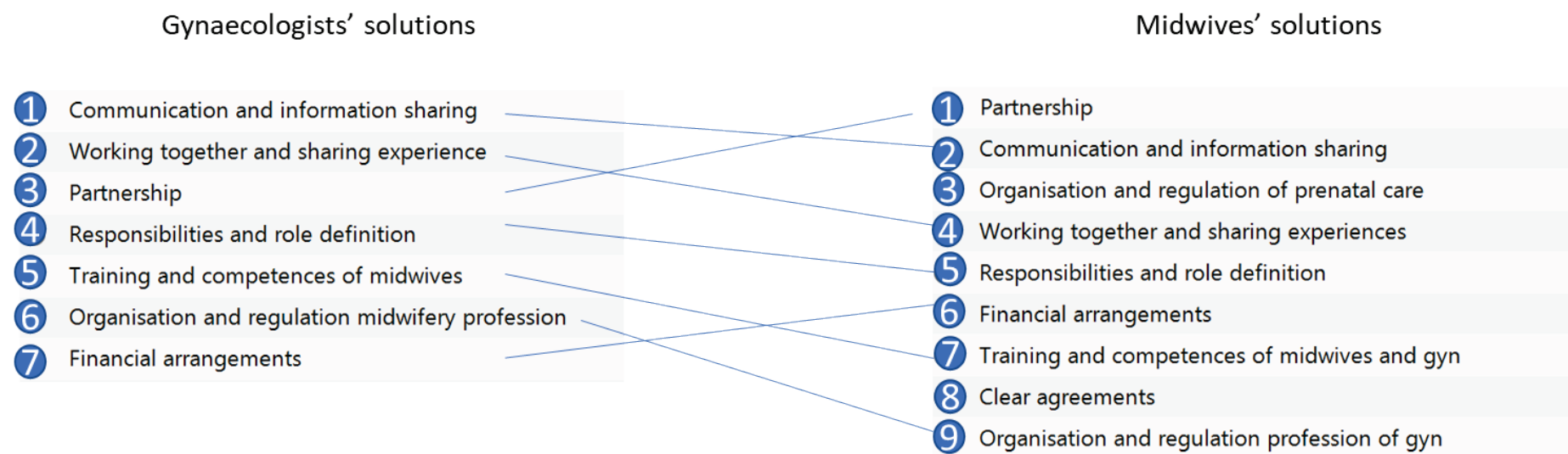
Sixth, midwives described a number of **financial arrangements** to promote interprofessional collaboration. They suggested the development of a financial framework beneficial for both gynaecologists and midwives, securing gynaecologists income, leave the fee-for-service system, increase midwives' remuneration, payment attributed to the one who does the work, financial consequences for abusive practices, clarification for inconsistencies in nomenclature, and a revision of the financing for antenatal follow-up of both low and high-risk pregnancies.

Seventh, regarding **training and competences**, midwives proposed joint trainings for midwives and gynaecologists and a better training for midwives.

Eighth, midwives suggested the development of clear agreements for example regarding guidelines for the antenatal follow-up of low-risk pregnancies and referral criteria.

Finally, midwives referred to the **organisation and regulation of the obstetric profession**, with for example gynaecologists being more trained in physiology and being more open to alternating follow-up.

Comparing gynaecologists' and midwives' suggestions to reinforce interprofessional collaboration, the same themes are listed, but not in the same order (see Figure 8). Still, partnership, communication and information sharing were in the top three of both professions. Financial arrangements, however, were less frequently mentioned by both gynaecologists and midwives.

**Figure 8 – Comparison of gynaecologists' and midwives' suggestions to improve interprofessional collaboration**

3.2.3.5 Attitudes regarding tools supporting referrals and communication

Table 11 presents the readiness of gynaecologists and midwives to use tools. It shows that midwives are more likely to use tools than gynaecologists. It is noteworthy that all midwives stated that they would use a referral tool if available. Nine out of ten midwives would use a communication tool. Only four out of ten Dutch-speaking gynaecologists would use a referral tool while 56% of the French-speaking gynaecologists would do. The use of a communication tool is more popular among gynaecologists as 76% would use it. However, this last result must be interpreted with caution because, when analysing the open questions respondents' arguments pro and contra using a communication tool, were sometimes opposite to the answer in the preceding closed question.

The most frequently used argument in favour of a risk selection instrument was uniformization, everybody basing their decisions on the same instrument. The second argument that stood out is the creation of clarity for all professionals. Third, an instrument would enable objective evidence-based judgement. Fourth, professionals hope it would prevent late referrals and dangerous situations. Fifth, the promotion of collaboration and reduction of interprofessional discussions were mentioned. Other, less often cited arguments were that it can be used for judicial purposes, that it would prevent high-risk pregnancies to be followed by a midwife, that it would improve communication, create more transparency, and allow professionals to function more rapidly (e.g. not wasting time with checking indications in literature).



The most cited argument against a referral tool was that gynaecologists are and should stay responsible for risk selection and at the same time that midwives are not trained to do risk selection. Also, it was argued that risk selection is too complex to leave it to a tool. In other words, a tool cannot replace the professional judgement of a gynaecologist. Another worry was that a low-risk pregnancy can quickly turn into a high risk, hence that it needs continuous monitoring. It is therefore useless to categorise pregnancies in low and high risk. Some respondents found a referral tool dangerous, as a professional can overlook risks if he/she focusses only on a predefined set of criteria. It would give the illusion of reassurance. A practical argument against a referral tool was that it needs continuous updating.

Table 11 – Readiness to use referral and/or communication tools by gynaecologists and midwives

	Gynaecologists	Midwives
French-speaking professionals		
Readiness to use a referral tool (n,%)	50 (56%)	67 (100%)
Readiness to use a communication tool (n,%)	71 (76%)	63 (95%)
Dutch-speaking professionals		
Readiness to use a referral tool (n,%)	134 (38%)	156 (100%)
Readiness to use a communication tool (n,%)	252 (76%)	150 (96%)
All professionals		
Readiness to use a referral tool (n,%)	184 (42%)	223 (100%)
Readiness to use a communication tool (n,%)	323 (76%)	213 (96%)

3.2.4

3.2.5 Discussion and conclusion

Respondents to the survey mostly suggested alternating consultations between a gynaecologist and a midwife for low-risk pregnancy follow-up. Alternating the follow-up with a GP seemed to be an approach specific to Dutch speaking professionals. To assess the clinical and psychosocial risk few practitioners used tools (clinical risk: 34% and 54%, psychosocial risk: 51% and 52%, respectively for gynaecologists and midwives). All surveyed midwives stated that they would use a referral tool if available whereas only four out of ten gynaecologists would do so. The most frequently used arguments in favour of the introduction of a referral instrument in Belgium were uniformization of practice, creation of clarity for all professionals, objective evidence-based judgement, safe referrals and promotion of collaboration. The main argument against the introduction of a referral instrument was that the medico-legal liability is always on the shoulders of gynaecologists, the lack of training of midwives in risk selection, the inability of a tool to substitute clinical judgement, the illusion of reassurance provided by a referral tool being reduced to a set of criteria and the need to continuously update the tool.

A good collaboration is required to provide alternating antenatal follow-up. Nine out of ten gynaecologists were satisfied about their collaboration with midwives, but only seven out of ten midwives were satisfied about their collaboration with gynaecologists. Midwives also reported that their professional network was not complete nor sufficient mainly for mental health issues. Both gynaecologists and midwives reported that shared vision, clear agreements on task repartition and good communication are needed to build the trust needed for a successful collaboration. The main barriers to collaboration are overconsumption, financial disincentives and unsupportive actions (e.g. anti-medicalisation attitude, uncollegial, counteracting and competitive behaviours). To improve collaboration, the three main solutions proposed by the respondents were building partnership, communication and information sharing. The identified facilitators and barriers are similar to those identified in the literature (see section 2.3).



These results must be interpreted with caution because of the impossibility to check the representativity of our respondent sample with respect to the overall population of professionals providing antenatal care. In addition, recruitment was performed by contacting participants through professional associations, which may have induced a selection bias by only inviting association members to participate. The characteristics of these caregivers may differ from those of the general population of antenatal care providers. Moreover, the high participation rate (89%) of Dutch-speaking gynaecologists is peculiar. We did not search for convergence among multiple coders regarding the analysis of the replies to the open questions. Hence, investigator triangulation was not done. Finally, the questions about satisfaction with interprofessional collaboration and the closed answer categories to these questions seemed to be too general. The fact that respondents used the open questions to specify their answers, can be an indication of a lack of construct validity. However, we thoroughly analysed the replies to the open questions with qualitative research techniques to give an accurate and nuanced description of the findings.

4 ANTENATAL RISK SELECTION TOOLS

For the purpose of this report, we will use mainly the term “Risk selection” to indicate the evaluation of risk during pregnancy. When the terms “risk assessment” and “risk stratification” are used, it is because those are the terms employed by the authors quoted

4.1 Introduction

Goodarzi et al in 2020 ⁶¹ provided insight into the three main dimensions of risk selection: (1) risk selection as an organizational measure to optimally align women's and children's needs and resources, (2) risk selection as a practice to detect and assess risk and to make decisions about the delivery of care, and (3) risk selection as a tool to ensure safe care. When searching for antenatal risk selection tools, what emerges is preponderantly the second dimension “risk selection as a practice to detect and assess risk and to make decisions about the delivery of care”, answering the main questions “Who” should deliver care and “Where” should such care be delivered in specific circumstances during pregnancy. The construction of these tools is based on scientific evidence but often more predominantly on professional consensus and they are mostly published as national, regional, and local guidelines.

4.2 Methods

4.2.1 Literature search

A literature review was used to identify risk selection tools or methods.

We searched Medline, Embase, EBSCOhost, CINAHL, and the Cochrane database from 2010 to November 2020. We included papers in English, French, Dutch and Italian.” Editorial, letter and case reports were excluded from the electronic search. Detailed search strategies are provided in supplement. The selection was performed independently by 2 researchers (EC; NB). Discrepancies were solved by discussion between the two researchers.



All reference lists of relevant publications identified through the electronic search were hand-searched and were completed by snowballing. In addition, field experts provided additional relevant documents.

4.2.2 Data extraction

Data extraction was performed by one researcher (EC). A narrative review was reported below.

4.3 Results

4.3.1 Risk selection tools in the literature

Hobel et al, in 1973⁶² **formally classified three different types of antenatal risk selection.** The first type of risk selection is the informal or clinical risk selection. In the clinical risk selection *“accuracy depends on the experience of the health professional”*. The second type of risk selection is a type of risk selection where *“presence or absence of single risk factors decide whether a person is at risk”*, this is the most commonly used risk selection strategy in national and regional guidelines. Finally, the third level of risk selection *“assigns each factor a statistical weighting to reflect the fact that different factors have different levels of effect”*. The tools using this third strategy are commonly called scoring systems.

Although the implicit hierarchy in the levels of risk selection is not highlighted in the most recent literature, the types of risk selection tools that we retrieved during our literature review, belong roughly to these three families.

There is a fourth type of risk selection that was not foreseen in 1973, and that bares some loose resemblance to scoring system-based risk selection: Artificial Intelligence (AI) -based risk selection, provided by apps. This new form of risk selection hasn't been implemented in daily clinical practice yet, but some apps are being tested^{63 64}

4.3.2 Clinical risk selection

All risk selection tools provide guidance for clinical judgment, but their scope is not to substitute provider-based clinical risk selection⁶⁵. Therefore, **clinical judgment with well-documented reasons overrides what can be stated in a risk selection tool, as it is, in fact, the case with any clinical guidance.** Besides, only the healthcare provider can assure that clinical management of the pregnant woman meets her individual needs and is in accordance with her preference and values, thus providing true woman-centered care, which is one of the possible blind spots of contemporary antenatal risk selection.⁶¹ Since this kind of risk selection is not specifically investigated in the literature retrieved, we won't elaborate further on this point.

4.3.3 Risk selections based on the presence or absence of single risk factors

Risk selection tools based on the presence or absence of single risk factors are either built for assessing the most appropriate antenatal follow-up pathway or to establish the most appropriate planned place of birth.

Examples of risk selection tools for antenatal follow-up

KCE report 248 “What are the recommended clinical assessments and screening tests during pregnancy”, issued in 2015³, provides a table reporting a list of conditions and risk factors that may imply further care in pregnancy. The list is organized into six main groups: general information, lifestyle factors, familial history, gynaecological history, clinical exam, and experiences in previous pregnancies. This history-taking should be completed with a clinical exam to identify risk factors. It does not offer guidance on the kind of additional care needed.

The Dutch List of Obstetric Indications (LOI, or ‘Nederlandse Verloskundige Indicatielijst, VIL’)⁶⁶, is a risk selection tool that aims to identify the most appropriate healthcare provider between first-line practitioners (midwife/general practitioner) and second-line practitioners (obstetrician, other specialists), for women with specific obstetric and non-obstetric conditions⁶⁷. The list was first redacted in 1958, where it listed 39 conditions.



The latest edition was issued in 2003 and included 143 conditions. Revisions of specific indications are done regularly, and a general revision of the list is currently ongoing. Each condition is classified in one of the following categories: A – if the condition still makes it appropriate for follow-up by first-line practitioners, B – if the condition entails an assessment that will determine whether first or second-line practitioners are best suited for follow-up, C – if the condition entails a follow-up by second-line practitioners and D – if the condition allows an antenatal follow-up in primary care but delivery needs to be carried out in a hospital to avoid a likely intrapartum transfer. The conditions are organized into four main groups: pre-existing non-gynaecological conditions, pre-existing gynaecological conditions, obstetric history, and onset during the current pregnancy. Women in the Netherlands are free to choose the healthcare provider (midwife, GP, or gynaecologist) for low-risk pregnancy follow-up. For an overview of the context of obstetric care in the Netherlands we refer to the supplement to the KCE report 326 “Towards integrated antenatal care for low-risk pregnancy”⁶.

In 2009 the ONE (Office de la Naissance et de l'Enfance) redacted in the « Guide de consultation prénatale »¹⁶, an adapted version of the Dutch VIL, directed to midwives and general practitioners working for ONE. Each condition is classified in one of four categories, which are slightly different from the original Dutch categories: A – if the condition still makes it appropriate for follow-up by first-line practitioners, B – if the condition entails an assessment that will determine whether first or second-line practitioners are best suited for follow-up, C – if the condition entails a follow-up by second-line practitioners and U – if the condition entails an urgent contact with the second line. The conditions are also organized into four main groups: pre-existing non-gynaecological conditions, pre-existing gynaecological conditions, obstetric history, and onset during the current pregnancy. In the 2022 edition of « Guide de consultation prénatale »⁵⁹, the adapted Belgian version of the VIL is no longer presented.

The 2008 NICE guideline “Antenatal care for uncomplicated pregnancies”⁶⁸ has in its scope to highlight the most appropriate care for low-risk pregnancies. It completes its purpose by providing a list of situations where pregnant women may not be considered low-risk anymore and therefore require additional care, other than the care outlined in the guideline. The list is divided into: conditions that usually require additional care, and obstetric

history that usually requires additional care. It does not offer guidance on the kind of additional care needed. This guideline has been partially updated in 2019. NICE recommends midwife- and GP-led models of care for women with an uncomplicated pregnancy. In august 2021 the guideline was replaced by the NICE guideline 201 “Antenatal care”.¹⁵ In this guideline, the list of situations that usually requires additional care is no longer reported, instead the recommendation is to

- Refer the woman for a clinical assessment by a doctor to detect cardiac conditions if there is a concern based on the pregnant woman's personal or family history
- Refer the woman to an obstetrician or other relevant doctor if there are any medical concerns or if review of current long-term medicines is needed.
- After discussion with and agreement from the woman, contact the woman's GP to share information about the pregnancy and potential concerns or complications during pregnancy.
- At every antenatal appointment, carry out a risk selection as follows:
 - ask the woman about her general health and wellbeing
 - ask the woman (and her partner, if present) if there are any concerns they would like to discuss
 - provide a safe environment and opportunities for the woman to discuss topics such as concerns at home, domestic abuse, concerns about the birth (for example, if she previously had a traumatic birth), or mental health concerns
 - review and reassess the plan of care for the pregnancy
 - identify women who need additional care.
- At every antenatal contact, update the woman's antenatal records to include details of history, test results, examination findings, medicines, and discussions.



For an overview of the context of obstetric care in the United Kingdom, we refer to the supplement of the KCE report 326 “Towards integrated antenatal care for low-risk pregnancy”⁶.

The 2020 Irish National Clinical Guideline “Stratification of clinical risk in Pregnancy”⁶⁹, provides evidence and a professional consensus-based tool to stratify a pregnant woman’s antenatal risk profile. The risk profile is categorized as normal-risk, medium-risk, and high-risk. It provides a list of risk factors organized into five main groups: maternal characteristics, medical history, previous obstetric history, and modifiable risk factors. Risk stratification is associated with a “Carestream”^j: either *Supported Care* intended for normal-risk mothers and babies, with midwives leading and delivering care within a multidisciplinary framework, or *Assisted Care*: intended for mothers and babies considered to be at medium-risk, and for normal-risk women who choose an obstetric service, care is led by a named obstetrician and delivered by obstetricians and midwives, as part of a multidisciplinary team, or *Specialised Care*: intended for high-risk mothers and babies, led by a named obstetrician, and delivered by obstetricians and midwives, as part of a multidisciplinary team. For an overview of the context of obstetric care in Ireland, we refer to the supplement of the KCE report 326 “Towards integrated antenatal care for low-risk pregnancy”⁶.

The French Haute Autorité de Santé (HAS) published in 2007, and updated in 2016, a set of professional recommendations called « Suivi et orientation des femmes enceintes en fonction des situations à risque identifiées »¹⁹ (“Monitoring and referral of pregnant women according to identified risk situations”). These recommendations specify for each of the at-risk situations identified (before, during, or at the beginning of pregnancy) the type of appropriate follow-up in terms of required healthcare professionals and the location of childbirth. They also describe the modalities of follow-up of pregnant women without complications. A list of situations at risk is compiled based on scientific literature. Risk factors that are investigated during the first consultation are organized into 5 groups: general risk factors, toxic substances, pre-existing medical history non-gynaecological, pre-existing gynaecological history, and obstetric history. For subsequent

antenatal contacts, they are organised into 7 groups: general risk factors (e.g. age, weight...), toxic substances, medical risk factors, infectious diseases, surgical risk factors, gynaecological risk factors, and obstetrical risk factors. For each risk factor, there is an indication of both the type of antenatal follow-up and the recommended planned place of birth. The types of antenatal follow-up are classified as follows: Pathway A: when pregnancy occurs without identified risk situations or when these situations are at low-risk, the follow-up can be provided by a midwife or a doctor (general practitioner, medical gynaecologist, or obstetrician-gynecologist) according to the choice of the pregnant woman. Procedure A1: the opinion of an obstetrician-gynecologist and/or another specialist is recommended. Procedure A2: the opinion of an obstetrician-gynecologist is necessary. The additional opinion of another specialist may also be required. Pathway B: when risk situations are identified, a regular follow-up must be ensured by an obstetrician-gynecologist. Depending on the risk situation, for an A1 or A2 procedure, if the risk is reversed or if the prognosis is favourable, the pregnancy is maintained in the original follow-up pathway (pathway A). Otherwise, if the risk is confirmed or if the course is unfavourable, the pregnancy is considered high risk and the follow-up corresponds to pathway B. This change may be transient and a return to a low-risk situation and follow-up in pathway A is possible. For an overview of the context of obstetric care in France, we refer to the supplement of the KCE report 326 “Towards integrated antenatal care for low-risk pregnancy”⁶.

The Australian 2019 guideline “Core practices in pregnancy care”⁷⁰, issues a list of conditions that may require additional care in pregnancy. The items in the list are organized into five main groups: existing conditions, experiences in previous pregnancies, previous major surgery, lifestyle considerations, and psychosocial factors. They do not offer guidance on the additional care needed but point out some resources that may assist in providing appropriate care.

The Australian College of Midwives, issued 2021 the fourth edition the “National midwifery guidelines for consultation and referral”⁷¹ The guidelines aim to provide an evidence-based, structured, decision-making framework

^j Carestream = clinical pathway



for midwives as primary maternity care providers. It provides a list of medical conditions that is paired with one of three levels of consultation or referral. They are divided into indications at the commencement of care (medical conditions, pre-existing gynaecological disorders, previous maternity history: antenatal, intrapartum, postpartum, neonatal, history of psychological or mental health, other considerations); Clinical indications developed or identified during the antepartum period, clinical indications during the intrapartum period, clinical indications during the postpartum period and social indications. The guidelines provide three levels of consultation or referral: discuss, consult and refer. *Discuss* means the midwife assumes primary responsibility for the maternity care of the woman (the midwife may discuss with another healthcare practitioner, but it is not indicated with whom). *Consult* means that the woman needs a consultation with a relevant medical practitioner or other healthcare provider. *Refer* means that maternity care is referred (temporarily or permanently) from a midwife to a medical practitioner who, in consultation with the woman, assumes responsibility for maternity care. An appendix to the guideline provides guidance on the line of conduct when a woman chooses care outside the national midwifery guidelines for consultation and referral. The appendix underwent legal review.

In British Columbia (Canada),⁷² the British Columbia College of Nurses and Midwives updated 2021 “Indications for discussion, consultation and transfer of care”. These indications are categorized as initial history, physical examination, antenatal care, labour and delivery, postpartum- maternal and postpartum- infant. The indications are then stratified according to three levels: discussion, consultation, or transfer. *Discussion* means that the primary care practitioner (called the registrant in the document) needs a discussion with other healthcare practitioners to provide the appropriate plan of care. *Consultation* means that a consultation with a physician or another regulated health practitioner is warranted. As a consequence, the primary care or responsibility of the woman may: continue with the registrant, be shared, or be transferred to the physician. *Transfer* is when primary care is transferred temporarily or permanently from the registrant to the physician.

In Quebec (Canada), the rules on cases requiring a doctor's advice or the transfer of care from a midwife to a doctor, are redacted in the form of binding law and were last updated in August 2020⁷³. Two separate lists of

situations require either a compulsory consultation with a medical doctor or a compulsory transfer of care. These lists are both organized into three main groups: medical history, current pregnancy, and labour & delivery. In this document, there is no methodology provided for the construction of the lists.

In New Zealand, a “Guideline for consultation with Obstetric and related Medical services”⁷⁴, was published in 2012 by the New Zealand’s Ministry of Health. It provides a list of risk factors categorized as pre-existing and/or co-existing medical conditions, previous gynaecological conditions or surgery, previous maternity history, current pregnancy, labour and birth and – first and second stage, labour, and birth – third stage, services following birth – mother and services following birth- baby. Referral for each condition is classified according to one of four categories: primary condition, consultation condition, transfer condition, and emergency condition. A Primary condition refers to a condition for which a Lead Medical Carer (LMC) will discuss with the woman that referral to another primary care provider may be warranted. A Consultation condition refers to a condition for which the LMC must recommend to the woman that a consultation with a specialist is warranted. A Transfer condition refers to a condition for which the LMC must recommend to the woman that there is a transfer of clinical responsibility from the LMC to a specialist. An emergency condition refers to a condition that requires immediate transfer of clinical responsibility for care from the LMC to the most appropriate available practitioner. The guidance includes a chapter on lines of conduct when a woman declines a referral, consultation, transfer of clinical responsibility, emergency treatment, or emergency transport.

Examples of risk selection tools to establish the planned place of birth

The different available places of birth are either different levels of care in an obstetrician-led unit or the choice between an obstetrician-led unit and midwife-led birth. Midwife-led births can occur either within the obstetrician-led unit, in an alongside midwife-led unit, in a freestanding midwife-led unit, or at home. Tools using this kind of strategy either provide a list of inclusion criteria or provide a list of exclusion criteria to assign the pregnancy to the most appropriate level of care.



Although the selection of the planned place of birth is beside the scope of this report, interested readers can find examples of risk selection tools for establishing the planned place of birth in the appendices.

4.3.4 Scoring systems

Risk selection tools using a scoring system have been considered in the past potentially more effective because they excluded experiential bias⁶². Although today they appear to be less frequently used than risk selection tools that focus on the presence or absence of single risk factors, we found some examples in the literature. Depending on the time during pregnancy when the score is evaluated, they can be used for antenatal risk selection, planned place of birth risk selection, or intrapartum risk selection.

A systematic review of risk scoring in pregnancy was performed in 1989 and showed insufficient evidence for the promotion of a formal scoring system.⁷⁵

In Alberta (Canada), an antepartum risk selection score is available since 1986, the last version was compiled in 2009⁷⁶. The risk selection tool is part of the Alberta Prenatal Record, and it lists a series of risk factors organized into four groups: pre-pregnancy, past obstetric history, problems in the current pregnancy, and other risk factors. There is a weight, ranging between 1 to 3, associated with every risk factor. Pregnancies with risk scores of 0 to 2 are considered low-risk, scores of 3 to 6 indicate a moderate risk and any risk score above 6 indicates a high-risk pregnancy⁶⁵. The scores are derived originally from studies of perinatal mortality.

Knox et al⁷⁷, developed an obstetric scoring system in 1993. Its construction relied on a database of 20,985 pregnancies registered in New Zealand containing 108 variables including maternal, antenatal, labour, delivery, postnatal and paediatric information. Among these, 27 variables had a significant and independent effect on obstetric outcomes. A second population of 3120 pregnancies was used to test the elaborated scoring system, using perinatal morbidity and mortality as indicators of poor obstetric outcomes. The threshold used for selecting high-risk pregnancies (0.8) was based on the sum of logistic coefficients associated with risk factors present during pregnancy. The sensitivity of this scoring system was 62.5% and the specificity 72.04%. This scoring system has been applied in 2013⁷⁸ in a

Turkish population, which yielded a 58% sensitivity and 50% specificity if administered upon admission.

Humphrey et al in 2017⁷⁹ published the validation of a risk score system used in rural Queensland (Australia) to assist in the triage of the appropriate facility for pregnancy care. The scoring system was first elaborated in 1992 since the basic provision of care was done by people without training in obstetrics and upgraded in 2014. Since its introduction, there was a marked drop in the regional perinatal mortality rate. The scoring system takes into consideration a list of risk factors organized into eight groups: maternal age, past obstetric history, past or present medical history, parity, present pregnancy, blood pressure, social factors, and mental health. A weight ranging between 0 and 4 is attributed to each risk factor. Adverse neonatal outcomes included perinatal death, congenital anomaly, pre-term birth, small for gestational age neonate, macrosomia, and N*/NICU admission. There was a statistically significant positive relationship between a risk score >8 and all adverse outcomes, and a negative relationship with a risk score of 0 or 1.

The Dutch R4U scorecard is different from other scoring systems by the combination of clinical and non-clinical criteria including 71 clinical and non-clinical antenatal risks⁸⁰. They are organized into six groups (social status, ethnicity, care, lifestyle, medical history, and obstetric history) allowing a quick uniform screening. Care pathways are created to support healthcare professionals who encounter complex (non-) medical risk factors. If the pregnant woman's individual sum risk score exceeds a risk threshold, based on weighted single risk factors, the case is assessed in a multidisciplinary setting⁸¹. R4U score has been correlated with the occurrence of small for gestational age neonates, preterm birth and Apgar score inferior to 7 at 5 minutes of life, in a cohort of urban, deprived pregnant women in Rotterdam². In a clustered randomized trial, the use of R4U, in addition to the use of LOI, had no demonstrable impact on the occurrence of small for gestational age neonates and/or preterm birth⁸². For an overview of the context of obstetric care in the Netherlands, we refer to the supplement of the KCE report 326 "Towards integrated antenatal care for low-risk pregnancy"⁶.



4.4 Discussion

The purpose of the explorative review was to identify antenatal risk selection tools to guide the referral decisions of primary care providers (i.e. midwives and GPs) during pregnancy follow-up. We searched for tools in peer-reviewed journals to extract a list of clinical situations (or criteria) to be adapted to the Belgian context by a (Delphi) panel of experts (see chapter 5).

A risk selection tool guides clinical judgment but does not replace it. Internationally, they are used to assign a pregnant woman to the most appropriate clinical pathway for antenatal follow-up or to select the planned place of birth. The exploratory review of the literature shows that antenatal risk selection can be performed either based on the practitioner's experience or by using tools based on the presence or absence of single risk factors or scoring systems.

Most risk selection tools included in national guidelines are based on the presence or absence of single risk factors. In some cases^{3, 15, 68, 71}, the tool is limited to a list of risk factors for which the woman “needs additional care”, without specifying the details of what this “additional care” may imply. In Quebec⁷³, the risk selection tool is inscribed into the law, and, as a consequence, it is uniformly implemented as it is compulsory. All other tools retrieved share the same principle of listing several relevant clinical situations and then recommending to stratify pregnancy risk along the following lines: (1) “low risk”, where follow-up may be continued in a primary care setting, (2) “intermediate risk”, where a certain degree of dialogue is needed to assign the pregnant woman to the most appropriate place of care, and finally (3) “high risk”, where it is clear that care of the pregnant woman is more appropriate in a specialised setting. A transversal overview of risk selection tools based on the presence or absence of single risk factors cited in the chapter can be found in table 1 (appendix)

The methodologies used in order to produce a risk selection tool based on the presence or absence of single risk factors may vary, but they all involved an extensive consultative process of an expert panel. This consultative process has taken the shape of a Delphi panel in Ireland¹⁸ and UK⁶⁸.

Beside the list of indications reported in KCE 248³ and the first edition of the antenatal guide published in ONE¹⁶, the survey described above (see section 2.4) showed that, in Belgium, care providers used mainly tools developed at the hospital level. The precision in the description of the criteria and their number varied according to the tool. An extensive and systematic search for grey literature could have made possible to identify additional tools developed at hospitals at the international level. However, the relevance of such as tools may be affected by the variation of antenatal care between countries. Therefore, we believe that we have reached saturation regarding the extraction of risk factors with the material available in the exploratory review. However, risk selection is a constantly evolving issue, especially with the increased use of artificial intelligence in medical sciences. Regular scientific monitoring is thus required.

Finally, the building of a denovo tool may rely on a large body of evidence reporting the impact of referral on a specific outcome for mother and newborn.⁶¹, but such evidence is probably valid mostly within the health system where it was developed. As also highlighted by Goodarzi in 2020⁶¹ there is a high level of complexity in risk selection, showing that the operationalization of risk selection is highly contextualized, determined by numerous factors including geography, demography, government policy, laws and regulations, history and culture. For this reasons we opted for the adaptation of existing tools to the Belgian context, and evidence about the impact of referral on specific outcomes is not reported.



5 DELPHI CONSULTATION ON CRITERIA SUPPORTING THE DECISION TO REFER PREGNANT WOMEN FROM A PRIMARY CARE PROVIDER TO A SPECIALIST DURING ANTENAL FOLLOW-UP

5.1 Introduction

We used a modified Delphi technique, to come to a consensus as to which clinical scenarios were relevant for primary care practitioners, and when and how to define referral from a primary care practitioner to a specialist in obstetrics and gynaecology (from here on: "Specialist"). The ultimate goal was to come to a consensus on which criteria and actions would be included in a tool that could guide primary care practitioners in coordinating antenatal follow-up on when and how to refer to specialist care (referral tool).

The Delphi technique is an iterative process, that employs subsequent rounds of voting, each round supported by anonymized results from the previous round, and is considered an effective means for determining consensus among experts, on matters where there is little or no evidence and where personal opinion is relevant.⁸³

We choose to use the Delphi method because we wanted to reach a consensus among representatives of different healthcare professions (midwives, gynaecologists, general practitioners) and different backgrounds (academic, nonacademic) which were bound by an imbalance of power dynamics and divergence of opinions long predating our project. Therefore, we opted for 3 professional groups of equal size to allow balance in power relations. As highlighted by Castro-Calvo et al⁸⁴, the anonymity of participants in the Delphi method avoids dominance of the opinion of only a few experts, avoids socio-psychological pressure to select specific answers and makes distancing oneself from publicly expressed views easier. The fact that panellists are provided at each round with anonymized feedback from previous rounds, fosters changing of opinion. Consequently, the Delphi technique facilitates collective intelligence or the "wisdom of crowds" (i.e.

the combined ability of a group of experts to jointly produce better results than those produced by each expert alone).⁸⁵⁻⁸⁷

The standard Delphi technique begins with an open-ended questionnaire given to a panel of experts to gather information about a subject matter.⁸⁸ In our case we opted for a modification to the standard procedure, starting with a list of pre-selected items, taken from the literature (see section 2.1).

5.2 Methods

5.2.1 Panel selection

We selected a panel of 30 healthcare practitioners involved in antenatal care: 10 midwives, 10 gynaecologists and 10 general practitioners (GPs). In each category, we included 5 French-speaking and 5 Dutch-speaking professionals.

Among gynaecologist :

- 4 panellists were representatives of a professional organisation : 2 of « Collège Royale des gynécologues obstétriciens de langue française de Belgique » (CRGOLFB) and 2 of "Vlaamse Vereniging voor Obstetrie en Gynaecologie" (VVOG)
- 2 panellists were identified by the research team based on their experience in collaboration with midwives providing antenatal care in primary care
- 2 panellists participated in the redaction of the Belgian adaptation of VIL that was present in the 2009 edition of the « Guide de consultation prénatale »¹⁶
- 2 panellists participated in KCE report 326⁶ regarding integrated antenatal care for low-risk pregnancy



Among GP:

- 2 panellists were representatives of a professional organisation ("Société Scientifique de Médecine Générale" (SSMG) and "Domus medica")
- 8 panellists were spontaneous applications after the publication of a call on the website of both professional organisations. They reported experience in antenatal follow-up in the primary care setting

Among midwives:

- 2 panellists were representatives of a professional organisation ("Union Professionnelle des Sages-Femmes Belges" (UPSfB) and "Vlaamse Beroepsorganisatie van Vroedvrouwen" (VBOV))
- 2 panellists were identified by the research team based on their experience in providing antenatal care in primary care
- 1 panellist participated to KCE report 326⁶ regarding integrated antenatal care for low-risk pregnancy
- 5 panellists were chosen by professional organisations for their professional experience in antenatal care

For more details on the panellists' affiliation and the conflict of interest, interested readers may refer to the colophon. Panellists were chosen for their experience in providing antenatal care and their knowledge of scientific evidence and the antenatal care organisation.

5.2.2 Pre-selection of items

The research team pre-selected the type and definitions of different "referral actions" (actions to be taken by the primary care practitioner in response to a clinical situation) and of "criteria" (relevant clinical and non-clinical situations that may occur during pregnancy). The basis of our selection was the first 6 tools that we retrieved in our explorative literature review^{3, 66, 68-70, 73} (see section 3), and 7 tools that we retrieved from the online survey on interprofessional collaboration (see section 2.4), the interested reader can find the comparison of criteria presented in the tools in appendix.

In the initial definition proposed in Round1 of the Delphi consultation, the referral actions were expressed in broad terms to allow the panellists to easily modify their content. The list of criteria was extracted from the available tools, and divided into 8 themes: general information, lifestyle, personal medical history, previous major surgery, gynaecologic history, obstetric history, psychosocial factors and current pregnancy. They were also formulated in the broadest terms possible, to allow modification on behalf of the panellists, such as the specification of relevant sub-criteria.

5.2.3 Structure of the Delphi consultation

The Delphi consultation consisted of 6 rounds of written consultation and 3 online meetings. The purpose of the written consultations was threefold. First, successive rounds were used to draft referral actions fitting the Belgian organisation of antenatal care. After, the written consultations were also used to select clinical situations (or criteria) that stemmed from existing tools and adapt them to the Belgian context. Finally, several rounds were used to match the final version of referral actions with selected clinical situations. These different consultation rounds were conducted in parallel depending on the speed to reach a consensus on the inclusion of a clinical situation. Online meetings have been used to prepare following rounds.

After round 1, all questions were accompanied by the anonymised most relevant comments that were made on each question by the panellists in the previous round. These were the motivations that panellists used to come to their decision, often supported by relevant literature citations.

The consensus threshold was set at 22/30. If there was a participation of fewer than 30 panellists, the consensus threshold was set at the number that corresponded to 75% of participants, rounded to the nearest whole number. While computing whether the threshold for consensus had been reached for a certain question, all answers that didn't take a position on the question (ex: I don't know, I am not competent to answer) were counted with the answer that got the majority of votes as it was announced to respondents. If an item received 8 votes or less (or less than the 25% of participants to the round, rounded up to the closest whole number), it was considered "agreement on exclusion" of that item.



The online Delphi consultations were carried out using Limesurvey®, the online meetings were carried out with Zoom, an online videoconferencing tool.

5.2.4 Round one

The first round of the Delphi consultation had the objective to come to a consensus on the number and definition of referral actions and criteria that would be relevant to the referral tool. All 30 panellists participated in the first round. The round consisted of two parts:

5.2.4.1 Part one

In the first part, we proposed a list of 5 referral actions drafted on the basis of referral actions proposed in the retrieved tools and adapted to the Belgian context.

1. Antenatal follow-up in primary care

If the criterion is met, the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are recommended during the midwifery-led antenatal follow-up: one in the first and one in the last trimester of pregnancy.

2. Secondary care advice

If the criterion is met, the primary care provider should consider a medical examination of the pregnant woman by a secondary care provider. The reason for this examination should be explained to pregnant women. In dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, the secondary care provider will decide whether the antenatal follow-up will be continued in a primary care setting or will be continued fully or partially in the secondary care setting.

3. Referral to secondary care

If the criterion is met, the pregnant woman should be referred to a secondary care provider. In dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, the secondary care

provider will decide whether the antenatal follow-up will be continued fully or partially in the secondary care setting.

4. Antenatal follow-up in primary care until 36 weeks of pregnancy

If the criterion is met, the antenatal follow-up may remain in a primary care setting for up to 36 weeks. At 36 weeks, the pregnant woman will be referred to a secondary care provider.

5. Emergency referral

If the criterion is met, the pregnant woman has to be immediately referred to a secondary care provider.

For each referral action panellists were asked

- Whether they agreed with the definition of the referral action, and whether a rephrasing of the referral action was necessary
- Whether they thought any other referral actions were necessary

5.2.4.2 Part two

In the second part, we proposed a preselection of criteria based on the extraction of the criteria from the tools identified in chapter 4. The sources of the criteria are reported in the supplement.

As a result, there were 153 criteria, grouped into 8 categories:

1. General information
2. Lifestyle
3. Personal medical history
4. Gynaecologic history
5. Psychosocial factors
6. Previous major surgery
7. Obstetric history
8. Current Pregnancy



For each criterion the panellists were asked:

- Whether the criterion should be included in the tool or not (Yes/No/I don't Know)
- Whether the criterion needs more specifications (for example whether there should be a specification on degrees of severity), and the opportunity of adding such specifications and other comments.

For each category of criteria, the panellists were asked whether other criteria should be added, and which ones.

The full list of criteria can be found in appendix.

5.2.5 *First online meeting*

The first online live meeting was done after the analysis of the results from Round 1. Sixteen people participated in the consultation, 7 midwives, 7 gynaecologists and 2 GPs, and three members of the KCE research team.

The objective of the first online meeting was to integrate the suggestions of the panellists into the definition of referral actions.

During this online meeting, the group discussed modifications of the referral actions as they were proposed in Round 1. The group reformulated the definitions of referral actions based on legal requirements and on the knowledge of maternity organisation. These definitions of referral actions were submitted to the whole panel during Round 2.

In addition, the referral action "Antenatal follow-up in primary care until 36 weeks of pregnancy" was deemed redundant by the group, so its deletion was submitted to the whole panel in round 2.

Also, during the online meeting, a preamble was proposed by the participants, which was submitted to the whole panel in round 2.

5.2.6 *Round two*

The objective of Round 2 was to find a consensus on the definition of referral actions elaborated in the first online meeting and to submit to the panel criteria that did not reach consensus, sub-criteria suggested by the panel for criteria for which the panel reached a consensus, and criteria that were suggested by the panel during round one. All 30 panellists participated in the round. The round consisted of two parts:

5.2.6.1 *Part one*

In the first part the panellists were asked for their approval of the formulation of the referral actions discussed in the online meeting, and approval of the deletion of the referral action "Antenatal follow-up in primary care until 36 weeks of pregnancy". All 30 panellists participated in the round.

The proposed modifications to the referral actions were the following



1. Antenatal follow-up in primary care

Original version	Modified version
If the criterion is met, the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are recommended during the midwifery-led antenatal follow-up: one in the first and one in the last trimester of the pregnancy.	If the criterion is met, coordination of the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are recommended: one in the first and one in the last trimester of the pregnancy. The medical assessment must be considered regardless of the 3 recommended ultrasounds. Nevertheless, an ultrasound examination can be considered as a medical assessment if the ultrasound is performed by a gynaecologist and paired with a consultation.

2. Secondary care advice

Original version	Modified version
If the criterion is met, the primary care provider should consider a medical examination of the pregnant woman by a secondary care provider. The reason for this examination should be explained to the pregnant woman. In dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, the secondary care provider will decide whether the antenatal follow-up will be continued in a primary care setting or will be continued fully or partially in the secondary care setting.	If the criterion is met, the primary care provider should consider a medical examination of the pregnant woman by a secondary care provider. The reason for this examination should be explained to the pregnant woman. The secondary care provider, in dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the coordination of the antenatal follow-up will be continued in a primary care setting or will be continued in a secondary care setting.

3. Referral to secondary care

Original version	Modified version
If the criterion is met, the pregnant woman should be referred to a secondary care provider. In dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, the secondary care provider will decide whether the antenatal follow-up will be continued fully or partially in the secondary care setting.	If the criterion is met, the pregnant woman should be referred to a secondary care provider, and the coordination of antenatal follow-up continued according to the decision made in a secondary-care setting. The secondary care provider, in dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the antenatal follow-up will be continued fully or partially in a secondary care setting.



5.2.6.2 Part two

In the second part we submitted to the panel criteria for which they did not reach a consensus. We submitted criteria for which different specifications or thresholds were proposed by the panellists based on their knowledge of the literature and the Belgian guidelines. Additional criteria were proposed in Round 1 by the panellists due to their relevance for the organisation of the follow-up were submitted in Round 2.

For each criterion submitted to the panel in Round 2, we reported the most pertinent comments made by the panellists in Round 1.

For criteria on which they did not reach agreement and for newly proposed criteria, the panellists were asked to respond on a 4-point Likert scale on their level of agreement to include such criterion in the tool: completely agree/agree/disagree/completely disagree and the options I don't know/ I am not competent to answer.

For specifications and thresholds, the panellists were asked to vote for the preferred specification/threshold.

5.2.7 Second online meeting

The second online live meeting was done after the analysis of the results from Round 2. Seventeen people participated in the consultation: 5 midwives, 6 gynaecologists and 2 GPs, and three members of the KCE research team.

The objective of the second online meeting was to explain the strategy we intended to use in order to avoid including in the tool a high number of rare diseases in the section "personal medical history", and to explain the strategy to resolve the problem of lack of consensus on some subcategories of criteria.

In the live meeting, the research team agreed with the panellists that we would exclude from the "Personal medical history" section all diseases that were rare (prevalence < 1/2000) in the reproductive age population (15-49 years, according to the WHO definition) in order to reduce the number of criteria and enhance the manageability of the tool.

To achieve this selection:

- All diseases present on the Orpha.net list of "Prevalence of rare diseases by diseases"⁸⁹ were excluded even if the incidence or prevalence data reported were not reported by age and sex if we had no reason to think that the prevalence of such diseases in women of reproductive age is higher than in the general population.
- For those diseases that were not listed in Orpha.net, we searched the most readily available literature on prevalence by age and sex, computing prevalence in women between the age of 15 and 49 (if not available, the prevalence in pregnant women). If prevalence in women of reproductive age was not readily available in the literature, we used prevalence in the general population if we had no reason to think that it would be higher in women of reproductive age.
- There was a certain number of diseases for which we suspected a prevalence < 1/2000 in women of reproductive age, but prevalence data were not readily available. Since extrapolation from incidence data (prevalence = mean incidence in reproductive age * length of reproductive age) was likely to produce an overestimate, we asked the panellists' opinion on the appropriateness of including such diseases in the tool, by providing incidence data in Round 3.

In order to resolve the lack of consensus on subcategories of criteria that were proposed by the panellists, since the propositions in rounds 1 and 2 were heterogeneous and sometimes conflicting, we proposed to the panellists to insert as subcategories or specifications, the subcategories or specifications that were found in the tools of our literature review, and that best matched the panellist's comments in round 1 and 2.

The list of rare diseases was proposed in round 3 to the panel and the matching with a appropriate referral action was submitted in round 5.



5.2.8 Round three

The objective of Round 3 was to match the criteria for which consensus had been reached with the appropriate referral action and to repeat criteria for which consensus was not yet reached.

The round was split into 5 sub rounds in order to avoid having an excessively lengthy survey. The sub-rounds were:

- Round 3a General information and lifestyle.
- Round 3b Personal medical history.
- Round 3c Gynecologic history and previous major surgery.
- Round 3d Obstetric history and psychosocial factors.
- Round 3e Current pregnancy

All 30 panellists participated in all sub-rounds, except for round 3e. In the latter, only 29 panellists participated.

Every sub-round consisted of two parts:

5.2.8.1 Part one

In part one we asked the panel to indicate which action was the most appropriate to respond to criteria on which they reached consensus in previous rounds (matching of criteria with referral actions).

The response options were: Antenatal follow-up in primary care/ Secondary care advice/ Referral to secondary care/ Emergency referral/ I don't know/ After careful consideration, this criterion should not be part of the instrument. If the choice of the referral action was influenced by the level of severity linked to the criterion, the panellists could choose more than one appropriate referral action and specify in the comment box the element(s) influencing the choice of each referral action.

5.2.8.2 Part two

In the second part, we submitted to the panel criteria on which they did not reach a consensus in Round 2. For each criterion submitted to the panel in Round 3, we reported the most pertinent comments made by the panellists in Round 2.

We asked the panellists whether the criterion should be part of the tool, the response options were Yes/No, with the possibility to leave a comment.

All criteria on which no consensus on inclusion was reached after two rounds of consultation, were dropped from further rounds.

In part two of the survey on personal medical history, we also asked the panellists whether diseases with a potential prevalence < 1/2000 in women of reproductive age, should be added to the "list of rare diseases". The possible answers were: Yes /No /I don't know /After careful consideration, this criterion should not be part of the instrument.

5.2.9 Round four

The objective of Round 4 was to match the criteria for which consensus on inclusion was reached with the action that should be taken for selected criteria.

For criteria that were already presented in Round 3, the choice of actions was limited to those who reached more than 8 votes during Round 3 (8 being the threshold to keep a referral action in the proposed list or below which it is considered that there is an agreement on exclusion). If the choice of the referral action was influenced by the level of severity linked to the criterion, the panellists could choose more than one appropriate referral action and specify in the comment box the element(s) influencing the choice of each referral action. After two rounds of matching, the criteria were not further proposed for matching and were classified as criteria for which there is agreement on inclusion and disagreement on matching.

For criteria that reached consensus on inclusion in Round 3, we asked the panel to indicate which action was the most appropriate to respond to criteria on which they reached consensus in previous rounds. The response options were: Antenatal follow-up in primary care/ Secondary care advice/ Referral



to secondary care/ Emergency referral/ I don't know/ After careful consideration, this criterion should not be part of the instrument. If the choice of the referral action was influenced by the level of severity linked to the criterion, the panellists could choose more than one appropriate referral action and specify in the comment box the element(s) influencing the choice of each referral action.

We added some criteria for inclusion that, for technical issues, were overlooked in previous rounds.

5.2.10 Third online meeting

The third online meeting was done after the analysis of round 4. There were 17 participants. 13 panellists (6 gynaecologists, 5 midwives and 2 GPs) and 4 members of the KCE research team.

The objective of this online meeting was to address some recurring comments that panellists made throughout the whole Delphi consultation and present the most likely format of the Delphi consultation results.

One recurring comment was that when we talked about "Secondary care provider" we were excluding tertiary care providers, although many of the criteria listed in the tool, would have to be managed in tertiary care. In order to avoid confusion, we proposed to use the term "specialist" instead of "secondary care provider". Where a specialist can be both in secondary or tertiary care.

Another recurring concept was the multidisciplinary concertation, where different types of care providers discuss cases in a multidisciplinary setting. It was sometime considered as the best action instead of a real referral action. We proposed to incorporate in a preamble and in one of the referral actions "Specialised care advice").(see chapter on round 5, part one)

Also, we were made aware that we never properly considered the possibility of a back referral to the first line. We proposed to incorporate this concept in a modification to the referral action "Referral to specialist care" (see chapter on round 5, part one).

We also proposed four extra preambles, we submitted the modification for consultative polling during the online meeting, and we agreed to submit the modifications to the whole Delphi panel via a fifth round (see chapter on round 5, part one).

5.2.11 Round Five

The objective of Round 5 was to submit the propositions on the inclusions of preambles and modifications of referral actions that were proposed during the third online meeting to the whole Delphi panel and also to finalise the inclusion and matching of criteria that, for technical issues, that had not been done in the previous rounds.

There were 23 participants in round 5: 8 GPs, 9 gynaecologists and 6 midwives.

5.2.11.1 Part one:

In part one of the Delphi consultation, we asked for the panel's approval for the modification of referral actions and the addition of five more preambles. Since only the referral action "Referral to specialist care" had a significant change in meaning, it was the only one that was submitted to voting. For clarity, we report the modifications of the other referral actions, as discussed at the third online meeting below.



- **Antenatal follow-up in primary care**

Original version	Adapted version
If the criterion is met, coordination of the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are recommended: one in the first and one in the last trimester of the pregnancy. The medical assessment must be considered regardless of the 3 recommended ultrasounds. Nevertheless, an ultrasound examination can be considered as a medical assessment if the ultrasound is performed by a gynaecologist and paired with a consultation.	If the criterion is met, coordination of the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are recommended: one in the first and one in the last trimester of the pregnancy, besides the three recommended ultrasounds. Nevertheless, an ultrasound examination can be considered as a medical assessment if the ultrasound is performed by a gynaecologist and paired with a consultation.

- **Secondary care advice has been adapted to Specialist's advice**

Original version	Adapted version
If the criterion is met, the primary care provider should consider a medical examination of the pregnant woman by a secondary care provider. The reason for this examination should be explained to the pregnant woman. The secondary care provider, in dialogue with the care provider	If the criterion is met, the primary care provider should consider a consultation for advice by a specialist or a multidisciplinary consultation including a specialist. The reason for this consultation should be explained to the pregnant woman. The specialist, in dialogue with the care provider initially chosen

initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the coordination of the antenatal follow-up will be continued in a primary care setting or will be continued in a secondary care setting.	by the pregnant woman and the pregnant woman herself, will decide whether the coordination of the antenatal follow-up will be continued in a primary care setting or will be continued in specialised care.
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- **Referral to secondary care adapted to Referral to specialist care**

Original version	Modified version
If the criterion is met, the pregnant woman should be referred to a secondary care provider, and the coordination of antenatal follow-up continued according to the decision made in a secondary-care setting. The secondary care provider, in dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the antenatal follow-up will be continued fully or partially in a secondary care setting	. If the criterion is met, the pregnant woman should be referred to a specialist, and the coordination of antenatal follow-up continued according to their decision. The specialist, in dialogue with the primary care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the antenatal follow-up will be continued fully or partially in specialised care. If the clinical situation is resolved, according to the specialist's judgement, coordination of antenatal follow-up may be referred back to primary care.



The five preambles that were discussed in the third online meeting and required approval by the whole Delphi panel are the following:

- 1 This tool is a non-exhaustive list of clinical situations (criteria) and corresponding referral actions, meant to guide primary care providers when referring to specialist care during antenatal follow-up.
- 2 This tool cannot be used as a checklist for anamnesis of a pregnant woman or as a substitute for clinical judgement.
- 3 Whenever possible, cases should be discussed in multidisciplinary antenatal concertation and, if appropriate, followed up in a multidisciplinary setting.
- 4 If the primary care provider encounters a clinical situation reported in the list of rare diseases, it is recommended **to refer/ ask advice (choice required from the panel)** to a specialist.
- 5 If the primary care provider encounters a relevant clinical situation that is not reported in the tool, it is recommended to **refer/ ask advice (choice required from the panel)** to a specialist.

5.2.11.2 Part Two

In the second part of the survey, we proposed to the panel criteria that had not yet had two rounds of matching or criteria for which there was progression on the building of consensus, with referral actions above the threshold of exclusion being reduced from 3 to 2. If for a certain criterion there was agreement on one referral action but there were other referral actions that reached neither the threshold for inclusion nor exclusion, the criterion was classified as having reached agreement on at least one referral action.

We also asked the panel if criteria that did not reach the agreement threshold nor the exclusion threshold for the list of rare diseases, should be considered as the list of rare diseases.

5.2.12 Delphi round for technical problems

One extra Delphi round was submitted to the panel after a comprehensive analysis of all previous rounds, in order to solve technical issues that were brought to light, regarding either inclusion or matching, for 9 criteria.

There were 28 participants: 9 gynecologists, 9 GPs and 10 midwives

5.3 Results

5.3.1 Referral actions and preambles

The Delphi panel reached a consensus on the following 4 referral actions and 6 preambles.

5.3.1.1 Referral Actions

For clarity please consider the following:

Primary care provider: a first-line healthcare practitioner that practices clinical follow-up of pregnancy, typically a midwife or a General Practitioner (GP)

Specialist: a specialist in obstetrics and gynecology (in secondary or tertiary care, according to the specialist's judgement)

Antenatal follow-up in primary care

If the criterion is met, coordination of the antenatal follow-up can remain in a primary care setting. As foreseen by the law, two medical assessments are still recommended: one in the first and one in the last trimester of the pregnancy, in addition to the three recommended ultrasounds. Nevertheless, an ultrasound examination can be considered as a medical assessment if the ultrasound is performed by a gynaecologist and paired with a consultation.



Specialist's advice

If the criterion is met, the primary care provider should consider a consultation for advice by a specialist or a multidisciplinary consultation including a specialist. The reason for this consultation should be explained to the pregnant woman. The specialist, in dialogue with the care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the coordination of the antenatal follow-up will be continued in a primary care setting or will be continued in specialised care.

Referral to specialist

If the criterion is met, the pregnant woman should be referred to a specialist, and the coordination of antenatal follow-up continued according to their decision. The specialist, in dialogue with the primary care provider initially chosen by the pregnant woman and the pregnant woman herself, will decide whether the antenatal follow-up will be continued fully or partially in specialised care. If the clinical situation is resolved, according to the specialist's judgement, coordination of antenatal follow-up may be referred back to primary care.

Emergency referral

If the criterion is met, the pregnant woman has to be immediately referred to a specialist.

5.3.1.2 Preambles

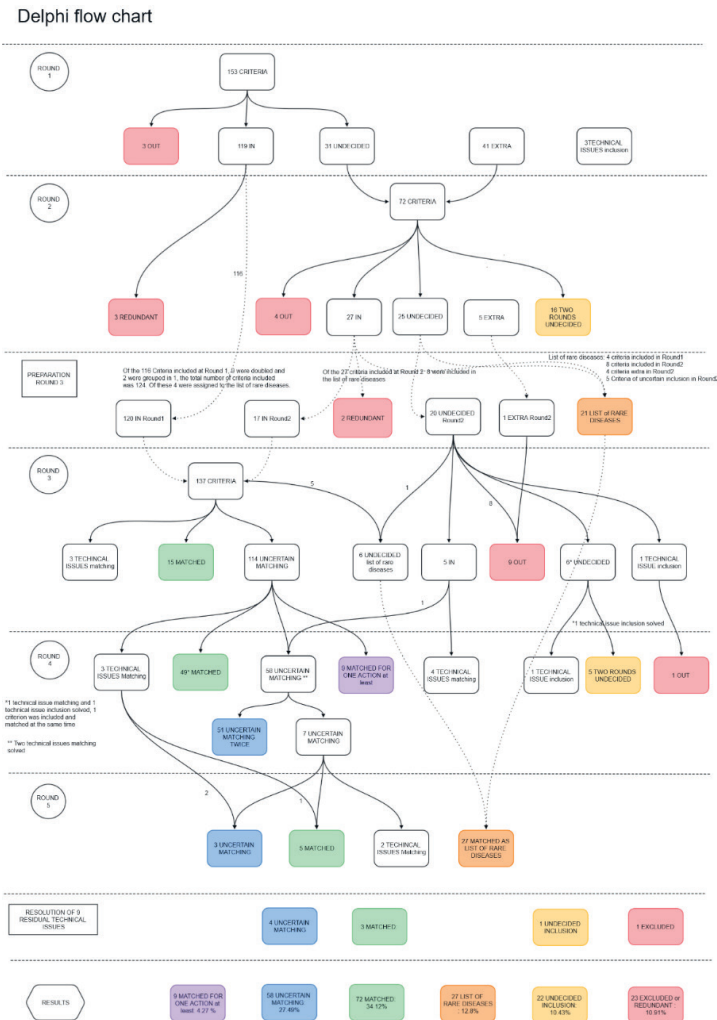
The Delphi panel agreed to include the following preambles:

- This tool is a non-exhaustive list of clinical situations (criteria) and corresponding referral actions, aimed to build consensus between primary care providers and specialists in order to guide referral to specialist care during primary-care provider-led antenatal follow-up
- This tool cannot be used as a checklist for anamnesis of a pregnant woman or as a substitute for clinical judgement

- Whenever possible, consider discussion of cases in multidisciplinary antenatal concertation and, if appropriate, follow-up in a multidisciplinary setting
- If the primary-care provider encounters a clinical situation reported on the list of rare diseases/disorders, a referral to specialist care is recommended (see referral action)
- If the primary care provider encounters a relevant clinical situation that is not included in the tool, specialist advice is recommended (see referral action)
- If the main care provider (from a primary or secondary setting) of the pregnant woman is not part of the team of the institution where the woman is planning to deliver, the woman should be referred to the delivery institution for at least one contact at 36 weeks at the latest with complete information regarding the follow-up

5.3.2 Criteria

There were 153 criteria that were submitted to the Delphi panel at round one, the Delphi panel added 41 criteria after round 1 and 5 after Round 2. As discussed above, during the second online meeting it was agreed that it was the task of the research team to define sub-criteria according to the definitions that were found in the literature and that best suited those that were suggested by the Delphi panel. Throughout 5 rounds, 23 criteria (10.91%) were either excluded or considered redundant, for 22(10.43%) there was never an agreement on inclusion or exclusion, 27 (12.8%) were included in the list of rare diseases, for 58 (27.49%) there was agreement on inclusion but no referral action reached the threshold for agreement, in 9 cases (4.27%) there was agreement on inclusion and agreement on one referral action, but at least on another referral action reached neither the threshold for inclusion nor exclusion and finally 72 criteria (34.12%) were successfully matched with a referral action. For a summary of how the inclusion and matching of the criteria proceeded across the Delphi rounds please refer to Figure 9.

**Figure 9 – Inclusion and matching of criteria across Delphi rounds**

Note for the readers: Results are presented according the level of consensus in the Delphi Panel. Delphi Panel came to a consensus on criteria shown in table 13 and 16. The Delphi Panel came to a consensus to exclude criteria presented in table 11. Finally, the Delphi Panel could not reach a consensus on the criteria shown in table 12, 14 and 15 either on the relevance of the criteria or the referral action.

!Click on the image to see it in full format!

5.3.2.1 Criteria for which the Delphi panel reached an agreement on exclusion

These are the criteria for which the panel agreed that should not be part of a referral tool. In order to exclude a criterion, the number of panellists who voted to exclude the criterion plus the number of panellists that did not express a preference for the criterion had to be 22 or more. We report the list of the excluded criteria, following which round they were excluded and the number of votes that were opposed to the inclusion.

**Table 12 – Criteria excluded by the Delphi panel from the referral instrument**

Criterion	Round	Votes
Being vegetarian	Round 1	No 24/30; I don't know 3/30
Vitamin B or Vitamin D deficiencies	Round 1	No 17/30; I don't know 6/30
Haemorrhoids	Round 1	No 25/30; I don't know 2/30
Use of medicines	Round 2	Excluded by the research team after analysis of Round1 see first online meeting
Urinary tract infection	Round 2	No 22/30; I don't know 1/30
Thyroid nodule enlargement	Round 2	No 22/30
Euthyroid goiter	Round 3	No 23/30; I don't know 2/30
Raynaud's phenomenon	Round 3	No 16/30; I don't know 8/30
History of gallstones	Round 3	No 28/30
Stomach ulcers	Round 3	No 29/30
Celiac disease	Round 3	No 22/30; I don't know 1/30
Seasonal Flu	Round 2	No 19/30; I don't know 3/30
History of COVID 19	Round 3	No 29/30
Psoriasis	Round 4	No 23/27
Migraine	Round 3	No 24/30
History of PCOS	Round 3	No 21/30; I don't know 1/30
Parity of 4 or more	Extra	No 21/28

5.3.2.2 Criteria for which the panel could not reach an agreement neither on inclusion nor on exclusion

These are the criteria for which the panel did not agree on whether they should be part of a tool or not after they were proposed to the panel for two rounds. We report the list of the criteria and the number of votes that were opposed to the inclusion

**Table 13 – Criteria neither included nor excluded by the Delphi panel for the referral instrument**

Criterion	Round	Votes
Immunization status	Round 2	No 19/30; I don't know 2/30
Short stature	Round 2	No: 15/30, I don't know 6/30
Being a Jehovah's witness	Round 2	No 21/30
Presence of thyroid autoantibodies	Round 3	No: 16/30; I don't know
Lumbosacral transitional vertebrae	Round 3	No 15/30; I don't know 6/30
Scoliosis	Round 3	No 11/30
History of transfusion	Extra	No 17/28
History of pelvic inflammatory disease	Round 3	No 10/30; I don't know 4/30
History of pregnancy hypertension	Round 2	No 9/30
History of gestational diabetes	Round 2	No 13/30
History of manual placental removal	Round 2	No: 12/30
History of abnormal lie at term	Round 2	No 19/30; I don't know 2/30
History of forceps/vacuum extraction	Round 2	No 19/30
History of incontinence for gas or stool after a previous birth	Round 2	No 14/30
Women who lack social support	Round 2	No 11/30
Language barrier	Round 2	No 13/30
Previous delivery less than a year ago	Round 2	No 15/30; I don't know 3/30
Late prenatal follow-up	Round 2	No: 10/30
COVID 19	Round 2	No 9/30
Positive first-trimester screening for pre-eclampsia	Round 3	No 12/29
Isolated proteinuria	Round 2	No 13/30
Varicose veins	Round 2	No 17/30; I don't know 1/30



5.3.2.3 List of rare diseases

These are the criteria belonging originally to the category “Personal medical history” that were considered to occur in women of reproductive age with a frequency < 1/2000

We report the criterion and the basis for the inclusion in the list of rare diseases

Table 14 – List of rare diseases

Disease	Reason for inclusion on list of rare diseases
Addison's disease	Included in the Orpha.net list
Auto immune hepatitis	Included in the Orpha.net list
Cushing's disease	Included in the Orpha.net list
Cystic fibrosis	Prevalence 1.03/10000 in the general population in Belgium Source: Farrell, 2008 ⁹⁰
Heart failure	Definite left ventricular systolic dysfunction in women < 45 is almost zero - Source: Mehta P, 2006 ⁹¹
Hepatoadenoma	Incidence of hepatic adenomas in oral contraceptive pill users ranges from 30 to 40 cases per million Source: Shreenath, 2022 ⁹² Incidence in contraceptive pill users is higher than the general population of women of reproductive age
Hyperaldosteronism	Would be found in women with pre-existing hypertension, the item would probably already warrant some form of referral
Insipid diabetes	Prevalence 1/250000 in the general population. Source: Hui, 2021 ⁹³
Immune thrombocytopenia	Included in the Orpha.net list
Malaria	Included in the Orpha.net list
Myasthenia gravis	Included in the Orpha.net list

Periarteritis Nodosa	Included in the Orpha.net list
Prolactinoma	Prevalence between 25/100000 to 63/100000 in the general population
Pulmonary hypertension	Included in the Orpha.net list
Renal agenesis	Included in the Orpha.net list
Rheumatic heart disease	Included in the Orpha.net list
Disease	Reason for inclusion on list of rare diseases
Scleroderma	Included in the Orpha.net list
Thrombocytopenia (immune thrombocytopenia)	Included in the Orpha.net list
Portal hypertension	Mostly secondary to cirrhosis
Cirrhosis:	Prevalence 2/100000 in pregnant women – Source: Flemming, 2020 ⁹⁴
Primary cholangitis sclerosis	Prevalence 5.58 per 100,000 – Source: Liang, 2017 ⁹⁵
Pulmonary embolism	Agreement of Delphi panel
Subarachnoid Hemorrhage	Agreement of Delphi panel
Cerebral aneurysm	Agreement of Delphi panel
End-stage Renal disease	Agreement of Delphi panel
TIA or Stroke	Agreement of Delphi panel
Myocardial infarction	Agreement of Delphi panel

5.3.2.4 Criteria for which the panel reached an agreement on inclusion in the tool but could not reach an agreement on the appropriate referral action

These are the criteria for whom the Delphi panel reached an agreement on inclusion but could not reach an agreement for at least one referral action, after being proposed twice for matching. We report the number of votes that obtained the referral actions that had more votes than the threshold for exclusion.

**Table 15 – Criteria included by the Delphi panel in the referral instrument, but without agreement on the most appropriate referral action (s)**

Criterion	Antenatal follow-up in primary care	Specialist's advice	Referral to specialist	Emergency referral
General information and lifestyle				
The pregnant woman uses recreational drugs such as marijuana, heroin, cocaine (including crack cocaine), amphetamines (e.g. 'ice') and ecstasy		11/27	19/27	
The pregnant woman reported smoking at the first antenatal visit		17/27	12/27	
The pregnant woman reported sexual behaviour at risk	15/27	12/27		
Personal medical history				
The pregnant woman has hyperthyroidism		19/27	9/27	
The pregnant woman has Rheumatoid Arthritis		11/27	17/27	
The pregnant woman has Arrhythmias		17/27	11/27	
The pregnant woman has Asthma	14/27	14/27		
The pregnant woman has Chronic Obstructive Pulmonary Disease		19/28	10/28	
The pregnant woman has a history of venous thrombosis		14/27	14/27	
The pregnant woman has hemoglobinopathies		15/27	16/27	
The pregnant woman has a history of Cancer	9/27	19/27	8/27	
The pregnant woman has Epilepsy		12/27	17/27	
The pregnant woman has a history of Psychosis		19/27	10/27	
The pregnant woman has a history of Depression	14/28	14/28		
The pregnant woman has a known HIV infection with an undetectable viral load		16/27	12/27	
The pregnant woman has Syphilis		13/27	14/27	
The pregnant woman has Hepatitis C		17/27	10/27	
Gynecologic history				
The pregnant woman has a history of conisation		13/27	14/27	
The pregnant woman has a uterine malformation		9/27	18/27	
The pregnant woman has a history of septum resection		16/27	11/27	
The pregnant woman has genital mutilation type III	9/27	19/27		
The pregnant woman has a history of myomectomy without opening the uterine cavity		18/27	10/27	



The pregnant woman has a history of history of cervical cryotherapy or loop excision		15/27	12/27
The pregnancy woman has a history of endometriosis	10/28	17/28	
Previous major surgery			
The pregnant woman has a history of previous cardiac surgery		12/23	12/23
The pregnant woman has a history of bariatric surgery		19/27	9/27
Obstetric history			
The pregnant woman has a history of ectopic pregnancy	16/27	11/27	
The pregnant woman has a history of recurrent miscarriage (three or more consecutive pregnancy losses) or a mid-trimester loss		11/27	16/27
The pregnant woman has a history of cervical insufficiency and/or cerclage and the pregnancy reached 37 weeks		19/27	
The pregnant woman has a history of preeclampsia		19/27	8/27
The pregnant woman has a history of blood group isoimmunization		16/27	12/27
The pregnant woman has a history of antenatal or postpartum haemorrhage on two occasions		13/27	16/27
The pregnant woman has a history of abruptio placentae		11/27	16/27
The pregnant woman has a history of premature preterm rupture of membranes		19/27	10/27
The pregnant woman has a history of preterm birth		16/27	14/27
The pregnant woman has a history of previous caesarean section	11/27	18/27	
The pregnant woman has a history of shoulder dystocia with neonatal sequelae	10/23	18/23	
The pregnant woman has a history of a child with macrosomia	12/27	17/27	
The pregnant woman has a history of severe perinatal morbidity		18/27	*10/27
Psychosocial factors			
The pregnant woman has a history of postpartum depression	16/27	12/27	
The pregnant woman has a psychosocial vulnerability	17/27	10/27	
Current pregnancy			
The current pregnancy has been conceived following treatment for subfertility	15/27	13/27	
The pregnant woman develops a STI in the current pregnancy: Syphilis		13/27	15/27
The pregnant woman developed a STI in the current pregnancy: Genital herpes primoinfection		19/27	*11/27
The pregnant woman develops Varicella Zoster primo-infection		14/27	14/27



The pregnant woman developed CMV primo infection/reactivation /reinfection		9/27	19/27
The pregnant woman presents blood loss after 16 weeks		12/27	16/27
The pregnant woman develops blood group isoimmunization		19/28	9/28
The pregnant woman develops anaemia <10 mg/dl		15/27	14/27
The pregnant woman presents isolated thrombocytopenia < 100000 /uL		12/27	16/27
The pregnant woman presents a coagulation anomaly		12/27	16/27
There is a feto-pelvic disproportion		12/27	15/27
The pregnant woman has gestational diabetes, well equilibrated, without suspicion of macrosomia	18/27	9/27	
The pregnant woman develops pregnancy induced hypertension		15/27	15/27
The pregnant woman develops preeclampsia		11/27	18/27
The child of the current pregnancy is planned to be given up for adoption	17/27	10/27	
Pregnancy beyond 41 weeks		12/23	11/23
There is an intrauterine fetal demise		12/27	15/27



5.3.2.5 *Criteria for which the panel reached an agreement on inclusion on one action but did not reach an agreement neither on inclusion nor on exclusion on at least another action.*

These are the criteria for which the panel agreed that they should be part of a tool and agreed on one referral action, but there is at least another action that received enough votes not to be excluded, but not enough votes to be agreed upon by the panel as a possible alternative referral action.

Table 16 – Criteria included by the Delphi panel for the referral instrument, with consensus on a referral action but without consensus on at least another referral action

Criterion	Round	Antenatal follow-up in primary care	Specialist's advice	Referral to specialist	Emergency referral
The pregnant woman is 18 or younger	Round 4		21/27	9/27	
The pregnant woman has hypertension	Round 4		8/27	21/27	
The pregnant woman has multiple sclerosis	Round 4		9/27	20/27	
The pregnant woman has Crohn's disease	Round 4		20/27	9/27	
The pregnant woman has Ulcerative colitis	Round 4		20/27	8/27	
The pregnant woman has genital mutilation type I/II	Round 4	8/27	20/27		
The pregnant woman has a history of a growth-restricted neonate	Round 4		20/27	8/27	
The pregnant woman develops Toxoplasmosis primo infection	Round 4		8/27	20/27	
The pregnant woman develops Viral Hepatitis (A B C D or E)	Round 4		8/27	20/27	



5.3.2.6 *Criteria for which the panel reached an agreement on inclusion in the tool and reach an agreement on the appropriate referral action*

These are the criteria for which the panel agreed that they should be part of a tool and agreed on the most appropriate referral action. To agree on a referral action, the number of panellists who voted for the referral action plus the number of panellists that did not express a preference for the referral

action had to be 22/30 or the closest integer number to 75% of the participants to the round. We report the included criteria, the referral action agreed upon, the round when the agreement on the referral action was made and the number of votes. We reported also the number of votes for the referral action that reached consensus for exclusion. Please note that the answers were not mutually exclusive, as panellists could choose several options.

Table 17 – Criteria included by the Delphi panel for the referral instrument, with consensus on an appropriate referral action

Criterion	Round	Antenatal follow-up in primary care	Specialist's advice	Referral to specialist	Emergency referral
General information and lifestyle					
The pregnant woman is 40 or older	Round 4		22/27		
The pregnant woman has a BMI 18 or less	Round 3		22/30		
The pregnant woman has a BMI of 35 or more	Round 4		23/27		
The pregnant woman has a history of alcohol misuse	Round 5		19/23		
Personal medical history					
The pregnant woman has a familial or hereditary disease	Round 3		24/30		
The pregnant woman has pre-existing diabetes	Round 3			22/30	
The pregnant woman has hypothyroidism	Round 3		24/30		
The pregnant woman has chronic kidney disease	Round 3			22/30	
The pregnant woman has an antiphospholipid antibody syndrome	Round 3			17+7/30	
The Pregnant woman has Sclerous Lupus Erithematosus	Round 4			24/27	
The pregnant woman has an allergy to a medication	Round 4	23/27			
The pregnant woman has one or several allergies	Round 4	22/27			
The pregnant woman has congenital heart disease	Round 4			21/27	
The pregnant woman has mitral valve prolapse	Extra			27/28	
The pregnant woman has Coagulation Disorders	Round 4			22/27	



The pregnant woman has a known HIV infection with a detectable viral load	Round 3	23/29
The pregnant woman has Hepatitis B	Round 4	20/27
The pregnant woman has Discal Hernia	Round 4	24/27
Gynaecologic history		
The pregnant woman has a history of cervical amputation	Round 3	22/30
The pregnant woman has an abnormal cervical cytology	Round 4	25/27
The pregnant woman has an obstetrically relevant myomatosis	Round 4	20/27
The pregnant woman has a history of myomectomy with an opening of the uterine cavity	Round 4	24/29
The pregnant woman has a history of pelvic abnormality	Round 4	22/27
Previous major surgery		
The pregnant woman has a history of reconstructive surgeries of the bladder and/or vagina and/or bowel	Round 4	22/27
The pregnant woman has a history of previous spine surgery	Extra	21/28
The pregnant woman has a history of previous brain surgery	Extra	23/28
Obstetric history		
The pregnant woman has a history of cervical insufficiency and/or cerclage and the pregnancy did not reach 37 weeks	Round 3	20/29
The pregnant woman has a history of acute fatty liver during pregnancy	Round 4	20/27
The pregnant woman has a history of pregnancy cholestasis	Round 4	20/27
The pregnant woman has a history of chorioamnionitis	Round 4	24/27
The pregnant woman has a history of Placenta Accreta Spectrum	Round 4	20/27
The pregnant woman has a history of symphysiolysis	Round 5	22/23
The pregnant woman has a history of 4th-degree tear	Round 4	23/27
The pregnant woman has a history of a child with a congenital/hereditary abnormality	Round 4	22/27
The pregnant woman has a history of perinatal mortality	Round 4	22/27



The pregnant woman has a history of non-accidental death of a child	Round 4	25/27	
Psychosocial factors			
The pregnant woman has a disability	Round 4	22/27	
The pregnant woman experiences ongoing domestic violence	Round 4	23/27	
The pregnant woman has a history of postpartum psychosis	Round 5	22/23	
Current pregnancy			
The current pregnancy has been conceived while on IUD	Round 4	26/27	
The current pregnancy is suspected to be an extra uterine pregnancy	Round 4		27/27
The pregnant woman develops Hyperemesis gravidarum	Round 4	26/27	
The current pregnancy is a multiple pregnancy	Round 4		26/27
The pregnant woman develops a STI in the current pregnancy: HIV	Round 3		25/29
The pregnant woman develops a STI in the current pregnancy: Gonorrhea	Round 4	25/27	
The pregnant woman develops a STI in the current pregnancy: Chlamydia	Round 4	25/27	
The pregnant woman develops a STI in the current pregnancy: Genital herpes reactivation	Round 4	24/27	
The pregnant woman develops Rubella	Round 3		
The pregnant woman develops Parvovirus B19	Round 4		21/27
The pregnant woman develops Listeria	Round 4		
The pregnant woman presents persistent blood loss before 16 weeks	Round 4	20/27	
The pregnant woman develops venous thrombosis	Round 4		24/27
The pregnant woman develops symptoms compatible with a suspicion of pulmonary embolism	Round 4		27/27
The pregnant woman has cervical insufficiency	Round 3		20/29
The pregnant woman has a cerclage	Round 4		23/27
The pregnant woman develops threatened preterm labour	Round 4		22/27



Detection of congenital anomalies at prenatal diagnosis	Round 5	17/23
The pregnant woman has placenta praevia	Round 3	26/27
The pregnant woman has vasa praevia	Round 3	21+3/29
The pregnant woman develops Polyhydramnios	Round 4	27/27
The pregnant woman develops Oligohydramnios	Round 4	23/27
There is a suspicion of a Small Gestational Age foetus	Round 4	26/27
There is a suspicion of a Large Gestational Age foetus	Round 4	21/27
The pregnant woman has gestational diabetes, not well equilibrated or with suspicion of macrosomia	Round 4	21/23
The pregnant woman develops abruptio placentae	Round 3	20+2/30
The pregnant woman has a preterm premature rupture of membranes	Round 4	23/27
The pregnant woman develops eclampsia	Round 3	
The pregnant woman develops HELLP	Round 4	27/27
The pregnant woman develops intra-hepatic cholestasis during pregnancy	Round 4	27/27
The foetus is in a non-cephalic presentation beyond 35 weeks	Round 4	26/27
The pregnant woman develops cancer	Round 4	27/27
The pregnant woman has to undergo a laparotomy/ laparoscopy during pregnancy	Round 4	25/27



5.4 Discussion

The goal of the Delphi consultation was to come to a consensus on the adaptation to the Belgian context a list of clinical situations (criteria) extracted from existing national and international referral tools. As the Delphi Panel reached an agreement on the definition of the referral actions and on only slightly more than half (57.83%) of the 211 criteria that were examined, we have to conclude that there is a significant divergence of opinion among our participants on what a Belgian referral tool should look like. As a consequence, there was no consensus on a tool including all relevant aspects to support referral decisions of the primary care providers during antenatal follow-up. Nonetheless, the results of the Delphi consultation provided a consensus on a certain amount of aspects of referral, that can be considered a common basis for practice agreements to be adapted according to local levels of experience. These results may be used by interested parties to construct a local referral tool to support interprofessional collaboration at local level. The fact that constructing a local tool using our results requires the active participation of all involved parties and not just its passive adoption, may enhance communication and collaboration among practitioners involved in antenatal care. Therefore, the results of the Delphi consultation may be seen as a first step towards a common referral tool for Belgium that would define a clear referral decision on all aspects relevant to prenatal follow-up. A common tool to all providers would enable the harmonization of referral practices and consequently equity in access to quality care for each pregnant woman according to her own needs.

The significant lack of consensus in our results may be traced back to several reasons:

- There may be a methodological limitation (partly brought by the fact that the project was initiated during COVID lockdown) of the use of an alternate of online Delphi panel rounds and online meetings, without ever giving the panellists the occasion of discussing face-to-face and explaining their point of view on the specifics of certain clinical situations.
- The description of the clinical situations of the online Delphi was deliberately formulated in broad terms, to allow for the panellists to bring in their input, but this choice may have left panellists with radically different interpretations of the same criterion.
- In earlier Delphi rounds especially, there may have been some confusion on the objective of the round. The objective was to select relevant criteria from the proposed list, the relevance of criteria may have come from the fact that there was an impact on the pregnancy and /or that was something that occurred often and may raise a question for the most appropriate follow-up. Only in a second time the criteria would have been matched with the appropriate referral actions (see section 4.2.3). In many cases the panellists, after voting to include a criterion, added the comment that it was “very rare”, or that it “had to obviously lead to a referral”, this suggested that the full scope of the earlier Delphi consultations may have been misunderstood. This led to the inclusion of a large number of criteria that made the employment of the Delphi methodology suboptimal for the task.
- The research team was allocated a limited time to the task. We learned from similar experiences, for example in the Netherlands, that negotiating this kind of tools between different professional categories is time-consuming (in the Netherlands it is taking several years).
- There may be a heterogeneous understanding among panellists on the extent of the responsibilities of primary and secondary care practitioners, a minority of panellists expressed the opinion that “coordination of follow-up can never remain in a primary care setting” (comment on round two).
- The basis of the construction of a referral tool goes beyond scientific and objective facts. The interprofessional discussion has to include the construction of a shared vision for antenatal, intrapartum and postpartum care, which needs to have its roots in mutual trust that, in its turn, has to be fostered by the broader context (see section 2.3). The construction of a shared vision is time-consuming and might have to be propedeutic to the construction of a tool.



The use of the Delphi technique was chosen because of several advantages given by the method (see section 1.2). However, Delphi consultation has also some relevant limitations such as:

- The arbitrary nature of the expert selection. The panellists were chosen on the basis of their extensive experience in interprofessional collaboration during antenatal follow-up, but there was no objective list of criteria that panellists had to fulfil in order to be selected (e.g. number of publications...). The selection of the panellists was largely made in collaboration with professional organisations that attested the panelist's experience in interprofessional collaboration during antenatal follow-up. However, using the Delphi method allowed us to gather a fairly large number of professionals, more than would have been possible if using working groups or guideline development groups.
- The fact that the primary care providers are both midwives and GP's may have affected the consensus process because of their different background and medical knowledge, as some criteria may be viewed as appropriate for first line follow up by a GP, although not by a midwife.
- Lack of reproducibility, because the selection of criteria and referral actions is not based only on objective criteria, but also on personal clinical experience, therefore a panel with a different composition may have led to a different outcome.

While computing the threshold for consensus, the answer modalities 'I don't know' and 'I am not competent to answer' were counted with the answer that got the majority of votes. However, after checking the impact of this methodological choice on agreement level, we can confirm that the impact is minimal..

The results of our Delphi panel consultation do not provide enough consensus on what should be the content of a complete Belgian referral instrument, but they may be used as a common basis to start local discussions on referral and possibly form the basis for local referral tools, while the reality of interprofessional collaboration in antenatal follow-up in Belgium evolves in a direction propice for the development of a national referral tool. The fact that consensus was not reached regarding the content of a complete Belgian referral instrument, supports the conclusion from chapter 3 that systemic change (in e.g. financing and education) is needed first.



6 REFERRAL BETWEEN PRIMARY AND SPECIALISED CARE PROVIDERS DURING LOW-RISK ANTENATAL FOLLOW-UP

As mentioned in report KCE 326⁶, antenatal care should include universal and integrated healthcare tailored in size and intensity according to the pregnant women's needs. This tailoring requires ongoing monitoring of the pregnant women's clinical and psychosocial risks, and seamless collaboration of all professionals involved. As a result of the analysis of the current situation in Belgium we can conclude that systemic changes (e.g. financing, education... as proposed in KCE report 326⁶) are needed before procedural changes (e.g. referral tool) can be effective, since procedural changes can only if the underlying conditions are met (see pyramid model, Figure 3). Nonetheless, this report proposes some guidance to support care providers following low-risk pregnancies in developing referral procedures adapted to their local realities as an intermediate step towards a national instrument, while working on systemic changes in the meantime.

6.1 Prerequisites for a safe referral during antenatal follow-up in primary care

6.1.1 *Integrated multidisciplinary care networks as a prerequisite for safe referrals*

As previously recommended⁶, an integrated multidisciplinary care network must be available for each pregnant woman. This network must integrate and coordinate the activities of several partners among which, at least, gynaecologists, primary care providers (midwives and GPs), physiotherapists, and agencies for family support of the federated entities (K&G, ONE, and Kaleido). The most adequate professionals have to be activated according to her specific profile and needs.⁶ This activation is based both on a continuous assessment of the clinical and psychosocial needs of the pregnant woman and on a multidisciplinary care network

available to respond timely and adequately to the needs identified during the antenatal follow-up.

When asking about the composition of their network, participants of our survey on referral habits mentioned a heterogeneous network including midwives, gynaecologists, GPs, other medical specialists, mental healthcare professionals, social workers, ONE/K&G/Kaleido staff members, physiotherapists or osteopaths. However, 63 % of the midwives and 28% of the gynaecologists estimated that their professional network was incomplete and insufficient for their antenatal practice, suggesting that an adequate and timely response cannot always be provided. It seems to be particularly the case for mental health problems where the lack of mental healthcare professionals specialised in antenatal issues was reported, leading to long waiting times. The creation of local databases of healthcare supply may help care providers to develop their network.

6.1.2 *A smooth collaboration*

Creating a network is more than only identifying potential partners. It is also to create conditions for interactions and shared actions (collaboration) between the members of a network i.e. a partnership. To create interprofessional collaboration, literature reported that tackling the silo effect, making accountability and professional borders clear, sharing visions, and building trust based on mutual respect, willingness to collaborate, and being familiar with each others' competences are key conditions for successful collaboration (see section 0). When surveying gynaecologists and midwives on their satisfaction about interprofessional collaboration, the same elements as those identified in the literature popped up from their answers. They also mentioned a lack of communication to motivate their dissatisfaction and financing was reported as an important barrier to collaboration.

When asking for suggestions to improve interprofessional collaboration, respondents to the survey (see section 2.4) proposed to build partnerships, improve communication and information sharing, define the accountability and the role of primary care providers and gynaecologists in the context of antenatal care, work together and share experience, improve training and competences, and regulate the professions of midwife and gynaecologist.



Partnership

Creating a partnership is linking the members of a network but also defining their role and accountability. The partnership may take several forms (formal or informal) and the type of partnership may vary according to the members of the network and the local context.

Formal partnerships may provide a legal framework to the network members. Role definition, borders of activities (e.g. using a referral tool) or financial agreement can be elements of a formal partnership.

Communication and information sharing

Communication is a crucial element during referral. In 2019⁶, promising e-Health initiatives were launched to facilitate the sharing, uniformization, and secure access to health data. These e-Health initiatives were completed by the e-Health roadmap 3.0⁹⁶ approved by the inter-ministerial conference in 2019. It includes activities regarding multidisciplinary information exchange, multidisciplinary collaboration, generalisation of the electronic patient record at hospitals and its accessibility by primary care providers and patients, communication, and planning of health and social care, and patient summaries for transborder use.. However, the implementation takes (too much) time and impairs the collaboration between care providers in general and during the antenatal follow-up in particular. The e-health roadmap 4.0 will be launched soon to take the evolution of the numeric environment of care a step further.

Accountability and role definition

During interprofessional collaboration needed for antenatal follow-up, the role of each partner must be clearly defined. The law organising the healthcare professions⁸ defines the competences of midwives, but not the role of medical doctors (GPs or gynaecologists) relative to antenatal follow-up. The interventions provided by a midwife during antenatal care and the drugs that can be prescribed are listed. The search for risks relative to mother and child is mentioned as part of the autonomous midwifery activities. However, the law does not describe how the risks must be assessed and which referral actions must be taken after risk identification. As medical sciences in general and antenatal care in particular, are rapidly evolving, it is not desirable that the law defines the risk assessment

method(s) or the referral actions. Still these issues should be addressed when national, regional, or professional antenatal guidelines are updated.

When liability matters are taken to court, the judge will always consider the circumstances and very often refer medical questions to an independent expert.¹³ Guidelines may help to harmonise the experts' advice regarding the general requirement of prudence, diligence, and properly referred pathological situations.

In addition, healthcare practitioners must take medical decisions based on relevant scientific evidence and his/her professional expertise, taking into account patients' preferences (article 4 of the Law on quality of care of 22 April 2019)¹⁴. This law defines, among others, the healthcare professional's competencies and experiences based on a personal portfolio, the obligation of continuity of care, and the obligation of registration of referral in the patient's record.

More details on liability during antenatal care can be found in the supplement of KCE report 326.¹³

Training

Interprofessional collaboration needs a collaborative practice-ready healthcare workforce.⁹⁷ A collaborative practice-ready healthcare worker is a professional who has learned how to work in an interprofessional team and is competent to do so. Interprofessional education can be organised during basic or continued education. The participants then learn about, from, and with each other, hence come to effective collaboration. The WHO reported that there is sufficient evidence to indicate that effective interprofessional education enables effective collaborative practice.⁹⁷ Therefore, interprofessional education could be used to tackle the silo effect reported in the literature and in the survey as a barrier to collaboration. It can also help to understand the borders of each other practice and enhance trust, mutual respect, and willingness to collaborate. In addition, identifying and supporting champions in antenatal collaboration can complete interprofessional education to enhance collaboration with sharing experience in a learning system approach.



6.2 The organisation of referrals between primary and specialised care during low-risk antenatal follow-up

As previously mentioned, guidelines can help to clarify professional boundaries between the different professions³¹. However, collaboration can also be achieved with protocols, care processes, pathways, and procedures,^{24, 29, 31, 41} or a detailed practice agreement.⁵¹ In the provision of antenatal follow-up in primary care, referral procedures are part of the collaboration definition. In the current Belgian antenatal care system, agreements on collaboration are already existing in some local contexts. Healthcare professionals in the field should develop their own way of organising interprofessional collaboration and referral procedures taking into account the availability of professionals and the history of collaboration in their local context. If the chosen form of agreement contains a list of situations in which referral from primary to specialised care is foreseen, it can be helpful to have a common basis for the development of referral procedures, such as the ones resulting from our Delphi consultation.

6.3 From local referral agreement to a Belgian referral agreement shared by all antenatal care providers

As mentioned in chapter 5, the result of the Delphi consultations captured the variability of opinions between Delphi panellists.

This variability, together with the results of our initial survey (see section 2.4) lead us to think that systemic changes, reported as prerequisites for referral during antenatal follow-up in primary care, are needed to allow the construction of a uniform referral instrument...

In a first step, those currently involved in the provision of antenatal follow-up in primary care could promote the local development of interprofessional collaboration and good practices for referral from primary to secondary care during antenatal follow-up. However, this first step should be followed by a generalisation phase to the whole territory (or at least at regional level) in order to harmonise referral practices and consequently guard equity in access to high quality and safe care for each pregnant woman according to her own needs. The work presented in this report is an invitation to antenatal care providers to sit together and discuss.



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