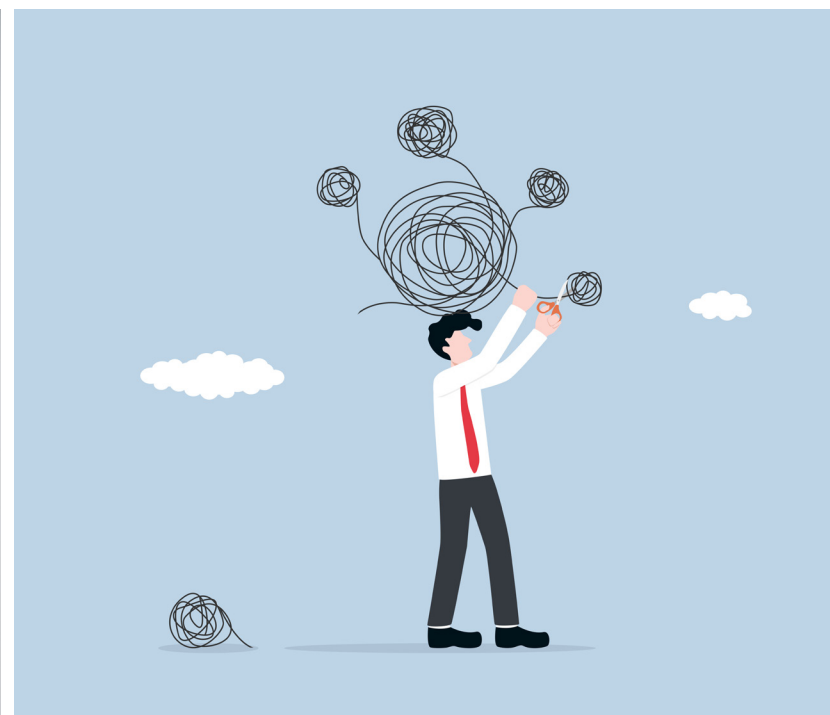


IDENTIFICATION, EVALUATION, AND SELECTION OF HEALTH CONDITIONS FOR THE NEED RESEARCH PROGRAMME



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Disclaimer:

- This report describes an internally developed process for the selection of topics for in-depth NEED research. It is published for transparency purposes.
- The external reviewers commented on a (preliminary) version of the report. They did not co-author the report and did not necessarily agree with its content.
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LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
BeBOD	Belgian Burden of Disease
DALYs	Disability-Adjusted Life Years
EU	European Union
EMA	European Medicines Agency
FAMHP	Federal Agency for Medicines and Health Products
HC	Health condition
HRQoL	Health-related quality of life
IHME	Institute for Health Metrics and Evaluation
LE	Life expectancy
LUSS	Ligues des usagers des services de santé
MCDA	Multi-criteria decision analysis
NEED	Needs Examination, Evaluation, and Dissemination
NIHDI	National Institute for Health and Disability Insurance
R&D	Research and development
SD	Standard deviation
VPP	Vlaams Patiënten Platform
WHO	World Health Organization
YLDs	Years lived with disability
YLLs	Years of life lost



■ SCIENTIFIC REPORT

1 INTRODUCTION

At the end of 2022, the NEED (Needs Examination, Evaluation and Dissemination) initiative was launched with the objective of developing and testing an innovative, evidence-based method to identify unmet needs and transition towards a needs-driven healthcare policy and innovation system. In early 2024, the first results of NEED were published and presented during the Belgian presidency of the Council of the European Union (EU). Among these results was a framework¹ that includes criteria and indicators to evaluate unmet health-related needs of patients and society, demonstrated through the assessment of unmet needs associated with Crohn's disease and malignant melanoma.^{2, 3}

These initial case studies were pragmatically chosen due to the tight deadline imposed by the EU Presidency. They were conducted to demonstrate the feasibility of applying the NEED assessment framework to evaluate the current and future unmet health-related needs in a specific health condition. However, in the future, it would be more appropriate to select health conditions using a structured and evidence-based approach, allowing research efforts to focus on conditions potentially presenting the most significant unmet needs. In this context, the NEED research team developed a more rigorous method for identifying and selecting health conditions for the NEED research programme.

The definitions of the various concepts related to unmet needs as well as the rationale and scope of the NEED approach can be consulted in the KCE report 377.¹



2 AIM

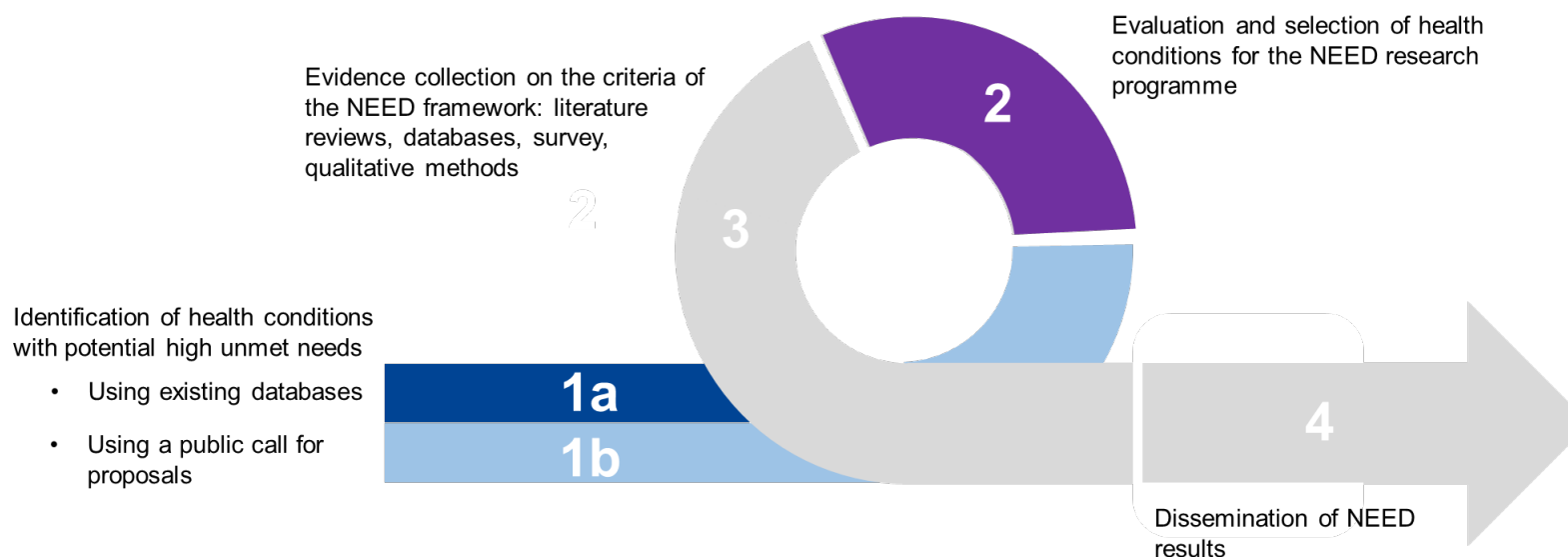
The aim of this report is to describe the first version of the standardised methodological procedure to identify, evaluate and select health conditions for the NEED research programme, as applied for the selection of the two first health conditions for the 2024-2026 NEED research programme. Therefore, this report presents both the development of the standardised procedure, along with the results from its application. The insights and areas for improvements identified in this report will be used to refine the standardised methodological procedure.

3 METHODS

The NEED approach is driven by a 4-step research implementation and dissemination model (Figure 1) that encompasses the different steps to perform a disease-specific unmet health-related needs assessment.

Within the 4-step model, the identification of health conditions for NEED research corresponds to step 1 (1a and 1b), while the evaluation and selection of health conditions for NEED research projects corresponds to step 2.

Figure 1 – 4-step NEED research implementation and dissemination model





3.1 Identification of health conditions with potential high unmet needs (step 1)

As not all health conditions (i.e. diseases, disorders, or syndromes) can be examined at the same time, unmet needs research must be prioritised. Two approaches are used to identify possible health conditions for NEED research projects: on the one hand, **existing databases** are used (step 1a) and on the other hand, a **public call** for topic proposals for NEED research projects is launched (step 1b).

3.1.1 Use of existing databases to identify health conditions with potential high unmet needs (step 1a)

In Step 1a, health conditions for NEED research are identified using existing national and international databases that include summary measures of population health with a health-related quality of life (HRQoL) component. These databases are used to draw up a list of health conditions with the highest burden of disease and therefore potentially the highest unmet health-related needs. At the national level, data from national burden of disease studies are preferred to data from the Global Burden of Disease (GBD) study^a.

Specifically for the 2024-2026 NEED research projects in Belgium, the Belgian Burden of Disease (BeBOD) database 2020^b was reviewed. The BeBOD study generates a large number of disease burden estimates by cause, age, sex, region, and year. The health conditions included in the study are those identified by the Institute for Health Metrics and Evaluation (IHME) and the World Health Organization (WHO) as causing the greatest health burden in Belgium, such as those in the top 30 of the disability-

adjusted life years (DALY; healthy life years lost due to morbidity and mortality) ranking.⁴ The BeBOD database includes: estimates of years of life lost (YLLs) for 131 causes of death^c, and estimates of years lived with disability (YLDs) and DALY for 38 causes^d.

Broad disease groups and non-specific health conditions (e.g. cancer, falls, low back disorder, neck disorder, prostate problems, thyroid problems, and unknown primary site cancer) were excluded because they were not specific enough and hence did not allow to identify the relevant patients and their specific needs following the health-condition specific approach applied in the NEED approach.

The top 7 health conditions with the highest total number of DALYs, the top 7 health conditions with the highest YLLs per death and the top 7 health conditions with the highest YLDs per case were selected to make a reduced list of high burden health conditions. Duplicates among the reduced list of the 21 high burden health conditions were removed.

3.1.2 Public call for topic proposals to identify health conditions with potential high unmet needs (step 1b)

In Step 1b, health conditions for NEED research are identified using a public call for topic proposals. The importance of this step is to cope with the limitations of the databases studied in Step 1a, i.e. limited number of health conditions, over-representation of health conditions affecting elderly populations, under-representation of certain conditions because they are rare, and high-level definition of health conditions. The topic proposals could relate to a disease or a health condition, thereby expanding the scope from a purely disease-oriented approach to a health condition-oriented approach (thus encompassing mental health conditions, and conditions without a

^a <https://www.healthdata.org/research-analysis/gbd-data> (Last consultation: 2 December 2024)

^b <https://www.sciensano.be/en/projects/belgian-national-burden-disease-study> (Last consultation: 2 December 2024)

^c <https://burden.sciensano.be/shiny/mortality/> (Last consultation: 2 December 2024)

^d <https://burden.sciensano.be/shiny/daly/> (Last consultation: 2 December 2024)



clearly understood pathophysiology, such as syndromes). In this report, we use the term “health condition” to refer to both diseases and health conditions.

An online survey is developed to collect the topic proposals from patients, patient organisations, healthcare professionals and the general public (see Appendix 1). In the online survey, information on the following criteria is requested:

- Impact of the health condition on patients’ quality of life
- Impact of the health condition on patients’ life expectancy
- Frequency of the health condition
- Accessibility, effectiveness, and burden of current management of the health condition
- Economic impact of the health condition on patients and society
- Impact of the health condition on vulnerable populations (transversal criterion, meaning that information on this criterion could apply to any of the previous criteria)

Once received, each submitted proposal is anonymised by a NEED team member who is not involved in the evaluation, prioritisation and selection of the topic proposals (Step 2). Submissions with missing information for most criteria are excluded (i.e., test submissions). For duplicate health conditions, information provided by the different respondents is merged. Submissions focusing on very broad umbrella terms covering a range of heterogeneous health conditions (e.g. “cancer”, “rare diseases”), symptoms or groups of symptoms, conditions for which no diagnosis or recognised diagnosis exists (yet), health behaviours or risk factors, and genetic mutations without an associated definable health condition are considered out-of-scope and are excluded. Submissions for closely related or overlapping conditions, or for different stages of the same condition, are merged.

For the selection of health conditions for two new NEED research projects (2024-2026), two calls for topic proposals were launched from January to March 2024, one in Belgium and one in Europe. The aim of the European call was to assess the feasibility of such a broader call while also identifying the unmet needs on a European level. The survey questionnaire (Appendix 1) was reviewed by the Belgian patient umbrella organisations (LUSS and VPP). The online survey was developed in LimeSurvey and was available in French, Dutch and English for the Belgian call for topic proposals; and solely in English for the European call. The calls for proposals were shared via the NEED website, KCE and Sciensano’s websites, and social media and sent to medical professional organisations across a range of specialties, relevant Belgian and European organisations (Appendix 1 and Appendix 2), as well as the national and international NEED advisory committees. Three online information sessions were organised, one with the French-speaking Belgian patient umbrella organisation (24/02/2024), one with the Dutch-speaking Belgian patient umbrella organisation (01/02/2024) and one in English for the European call for proposal (06/02/2024). During the information sessions, the NEED team presented the questionnaire for the call for proposals, outlined the type of submissions considered out-of-scope, broadly explained the procedure for the evaluation and selection of health conditions (step 2) and answered participants’ questions.

Belgian patient associations also disseminated information about the NEED call for proposals to their members. The recording of the session in English was made available on the NEED website.



3.2 Evaluation and selection of health conditions from databases and the call for proposals (step 2)

Step 2 defines how the health conditions with potentially high unmet needs identified in Step 1 are evaluated and selected (see Figure 2). This process consists of three phases: the first phase serves to establish a shortlist of health conditions based on a limited number of criteria, the second phase further reduces the shortlist by considering additional criteria and the third phase consists of making the final selection for the NEED research projects. The final number of health conditions selected depends on the available research budget.

3.2.1 Phase 1: evaluation and prioritisation

In Phase 1, three selection criteria are used to rank health conditions from existing databases and from the call for proposals:

- Impact of the health condition on patients' quality of life
- Impact of the health condition on patients' life expectancy
- Frequency of the health condition

A separate list is created for rare health conditions to avoid that rare health conditions don't get a chance to be shortlisted.

a) To be able to rank health conditions based on the three selection criteria mentioned above, data on the criteria needs to be available for all health conditions. Therefore, for the pre-selected health conditions from BeBOD (Step 1a), NEED researchers collect evidence from the scientific literature on the three criteria. For health conditions submitted through the call for proposals (step 1b), NEED researchers collect evidence on the three criteria whenever information is missing or incomplete in the submitted proposal. When data is available in the submitted proposal, a quick accuracy check of the data is performed. Duplicate health conditions between the BeBOD database and the call for proposal are removed, but data from these two sources are merged and used for the evaluation.

- b) All health conditions are evaluated independently by three NEED researchers, by assigning a score to the three selection criteria based on the provided and collected information. A questionnaire in LimeSurvey was developed for reviewers to submit their scores, along with guidance (see Table 1) on how to evaluate the different criteria. Health conditions should be evaluated overall (1) not only for the specific disease stage that might be mentioned in the submission to the call for proposal, and (2) taking into account the average impact of the health condition on patient's quality of life and life expectancy across disease subtypes, stages or severity levels. For each health condition, an average score is calculated based on all available criteria scores. First, for each criterion with available data, an average score across evaluators and its standard deviation are calculated (sum of scores divided by the number of evaluators). Second, the average scores per criterion were rescaled to a 0-100 range, using min-max normalisation. Third, an overall average score is calculated (sum of criterion's average score divided by the number of criteria with available data).
- c) Uncertainty in the scores is dealt with by discussing the criteria for which there is much variation between evaluators. More precisely, when the standard deviation of the average score for a criterion was > 1 , evaluators' scores for this criterion were discussed with the research team and evaluators had the possibility to adjust their score accordingly. This step helps to reduce variation in scores caused by differences in interpretations of the data or varying appreciations of its quality.
- d) All included health conditions are ranked in descending order based on their overall average score, with separate rankings for non-rare and rare health conditions. The higher the average score, the higher the priority for studying the unmet needs associated with the health condition.



Two shortlists of the non-rare and rare health conditions with the highest average scores are created. The number of health conditions to be shortlisted and evaluated in Phase 2 can be determined based on the human resources available to appraise these, and also on the target number of health conditions to ultimately be assessed via NEED research and inserted into the database. The feasibility of conducting unmet needs research for the shortlisted health conditions is also assessed, considering the available resources. If a health condition is deemed unfeasible for study, the next feasible one on the list is shortlisted.

For the 2024-2026 NEED research projects, we shortlisted the eight non-rare health conditions with the highest scores, and the four rare health conditions with the highest scores. In addition, conducting unmet needs research on pediatric health conditions was deemed unfeasible for the 2024-2026 NEED research projects because the current data collection methods (i.e. patient survey and interview guide) are not yet suitable for children.

Figure 2 – Evaluation and selection process of health conditions from databases and the call for proposals: shortlisting health conditions

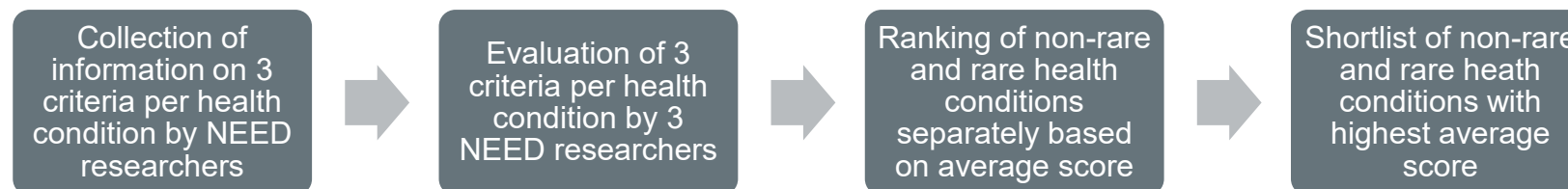


**Table 1 – Selection criteria for Phase 1**

Phase 1 selection criteria	Answer options
Impact of the health condition on patients' HRQoL	1: Slight impact (on at least one dimension: physical health, psychological health, autonomy) 2: Moderate impact (on at least one dimension: physical health, psychological health, autonomy) 3: Severe impact (on at least one dimension: physical health, psychological health, autonomy) 4: Extreme impact (on at least one dimension: physical health, psychological health, autonomy) For guidance purposes: - Based on HRQoL data (with higher scores representing a better HRQoL): 1: Scores 75-100 2: Scores 50-75 3: Scores 25-50 4: Scores 0-25 - Based on YLD/case data (with lower figures representing a better HRQoL) : 1: <0.02 YLD/case 2: 0.02-0.06 YLD/case 3: 0.06-0.11 YLD/case 4: >0.11 YLD/case
Impact of the health condition on patients' life expectancy	1: <13.6 YLL/death 2: 13.6 – 17.8 YLL/death 3: 17.8 – 23.9 YLL/death 4: 23.9 – 42.5 YLL/death 5: >42.5 YLL/death
Frequency (prevalence) of the health condition	Non-rare health conditions 1: 14.5 - 77.5 per 100 000 2: 77.5 - 327.1 per 100 000 3: 327.1 - 1781.9 per 100 000 4: > 1781.9 per 100 000 Rare health conditions: 1: <1/1 000 000 2: 1/1 000 000 - 1/100 000 3: 1/100 000 - 1/10 000 4: >1/10 000 (and <5/10 000)



3.2.2 Phase 2: evaluation and ranking

Phase 2 evaluation defines how the final selection of health conditions for NEED research is established. A more comprehensive evaluation of the shortlisted non-rare and rare health conditions is conducted based on the three criteria included in phase 1 and two additional criteria:

- Economic impact of the health condition on patients and on society
- Impact of the health condition on vulnerable populations (transversal criterion, meaning that it could relate to any of the other criteria considered or even aspects not considered in this selection process).

The more comprehensive evaluation of shortlisted health conditions results in a new ranking.

- a) For the shortlisted health conditions, NEED researchers collect evidence on the two additional criteria whenever this information is not available in the submitted proposal. When data is available from the submitted proposal, a quick accuracy check of the data is performed.
- b) The shortlisted health conditions are evaluated independently by three NEED researchers to the two additional selection criteria based on the information provided. A questionnaire in LimeSurvey was developed for reviewers to submit their scores, along with guidance (see Table 2) on how to evaluate the different criteria.

- c) For each health condition, an average score of all the criteria scores for which data are available is estimated. First, for each criterion with available data, an average score across evaluators and its standard deviation are calculated (sum of scores divided by the number of evaluators). Second, the average scores per criterion were rescaled to a 0-100 range, using min-max normalisation. Third, an overall average score is calculated (sum of criterion's average score divided by the number of criteria with available data).
- e) Uncertainty in the scores is dealt with by discussing the criteria for which there is much variation across scores. More precisely, when the standard deviation of the average score for a criterion was > 1 , evaluators' scores for this criterion were discussed with the research team and evaluators had the possibility to adjust their score accordingly. This step helps to reduce variation in scores caused by different interpretations of the data or varying appreciations of its quality.
- d) The shortlisted health conditions are ranked again in descending order based on their average score. The higher the average score, the higher the priority for studying the unmet needs associated with the health condition.

For the 2024-2026 NEED research projects, the Phase 2 evaluation was applied to the eight shortlisted non-rare health conditions and the four shortlisted rare health conditions.

Figure 3 – Selection process of non-rare or rare health conditions for the NEED research programme



**Table 2 – Selection criteria for Phase 2**

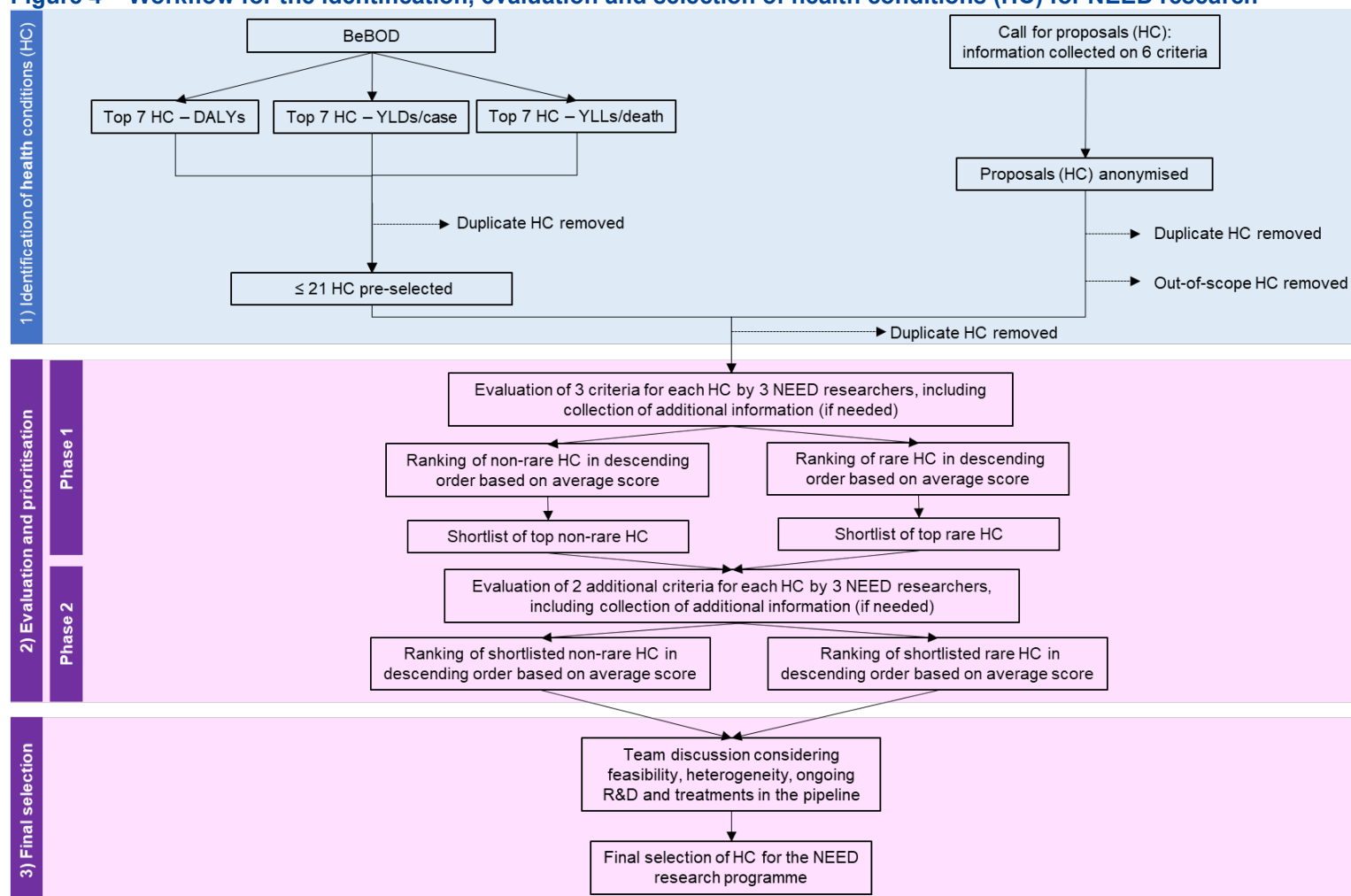
Phase 2 criteria	Answer options
Economic impact of the health condition on patients and on society	1: <10 000 €/patient/year 2: 10 000-30 000 €/patient/year 3: 30 000-50 000 €/patient/year 4: >50 000 €/patient/year
Impact of the health condition on vulnerable populations (transversal)	1: The health condition does not or not differently affect vulnerable populations. 2: The health condition affects one vulnerable population somewhat more than the general population 3: The health condition affects multiple vulnerable populations somewhat more than the general population 4: The health condition affects one vulnerable population a lot more than the general population 5: The health condition affects multiple vulnerable populations a lot more than the general population OR the health condition is a paediatric disease/disorder (affects primarily infants and children)

3.2.3 Phase 3: selection of two health conditions for NEED research

1. The number of health conditions to be included in the NEED database depends on available resources. The final selection of health conditions involves prioritising the highest ranked health conditions on the list(s) while ensuring a balance across different disease groups (i.e. heterogeneity), affected populations (e.g. age groups) and levels of public and private R&D in the last five years. Additionally, the feasibility of performing unmet needs research given the current resources available is taken into account.

It is important to take into account information on ongoing R&D to ensure that the unmet health-related needs presented in the NEED database remain relevant for the next few years. Evidence on ongoing R&D can be based on information from, at the Belgian level, the special solidarity fund of the National Institute for Health and Disability Insurance (NIHDI), the NIHDI Unmet Medical Needs Programme, the list of products in a medical need programme or a compassionate use programme (FAMHP) and/or the list of unavailable medicines (PharmaStatus). At the international level, the International Horizon Scanning Initiative (IHSI) database, the list of pharmaceuticals that received conditional marketing authorisation (EMA), orphan designation (EMA) or which were included in the PRIME scheme (EMA) can be considered.

2. This final selection of health conditions and the list of identified health conditions with potential high unmet needs are communicated via the NEED website and via email to all individuals who submitted a proposal. For the 2024 NEED research programme, one rare health condition and one non-rare health condition were chosen.

**Figure 4 – Workflow for the identification, evaluation and selection of health conditions (HC) for NEED research**



4 RESULTS

4.1 Identification of health conditions with potential high unmet needs (step 1)

4.1.1 Using the BeBOD study to identify health conditions with potential high unmet needs in Belgium (step 1a)

We excluded from the BeBOD study any causes that were not health conditions, disorders or syndromes, as well as conditions that were too broad (e.g. “gynaecological diseases”), symptoms or health statuses with diverse causes (e.g. “visual loss”), and acute COVID-19 infection (as not relevant anymore for 2024; Appendix 3 Table 10). Table 3 presents the results of the top 7 health conditions by summary measure of population health for the BeBOD study.

After removing two duplicate health conditions (cerebrovascular disease and unipolar depressive disorders), a total of 19 health conditions were retained from the BeBOD study.

Table 3 – Health conditions with potential high unmet needs identified through the BeBOD study 2020

Using YLD/case		Using YLL/death	Using DALY
1	Schizophrenia	Sudden infant death syndrome	Unipolar depressive disorders
2	Epilepsy	Preterm complications	Trachea, bronchus, and lung cancers
3	Rheumatoid arthritis	Sepsis and other infectious disorders of the newborn baby	Ischaemic heart disease
4	Bipolar disorder	Neonatal encephalopathy (birth asphyxia and birth trauma)	Low back pain
5	Cerebrovascular disease	Congenital anomalies	Alcohol use disorders
6	Unipolar depressive disorders	Drug use disorders	Chronic obstructive pulmonary disease
7	Alzheimer's disease and other dementias	Self-harm	Cerebrovascular disease

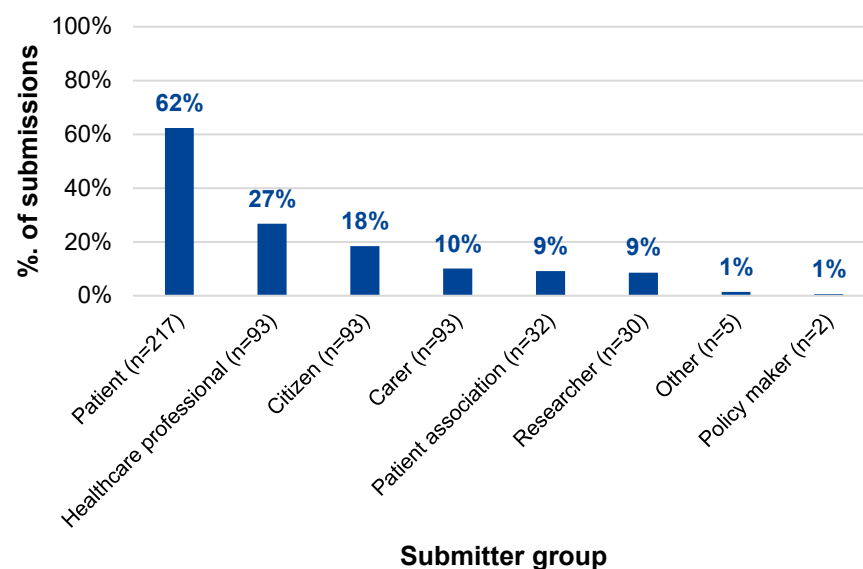
*Duplicate health conditions, which will be kept to a single mention, are highlighted in **bold**.*



4.1.2 Using the Belgian call for proposals to identify health conditions with potential high unmet needs (step 1b)

From the Belgian call for proposals, we obtained a total of 348 submissions. Among the proposals received, 62% of submitters were patients, 27% healthcare professionals and 18% citizens (Figure 5).

Figure 5 – Distribution of submissions (n=348) to the Belgian call for proposals by submitter group*



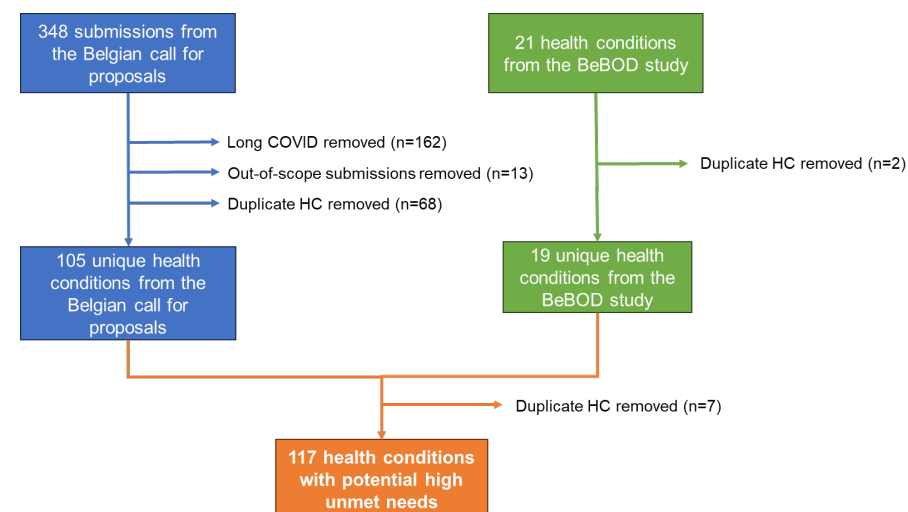
*Submitter groups are not mutually exclusive.

Almost half of the submissions (n=162) were for long Covid. Because KCE published a report on the unmet needs of patients with long COVID in 2021 (KCE report 344), we decided to update the results from the previous KCE report 344 (2021) rather than include long COVID in the list of health

conditions to be examined in-depth by means of a new NEED research project. Data collected from the survey on patient's experiences that are still relevant today will be included in the NEED database.

Within the call, after excluding out-of-scope submissions (n=13) (Table 11), and duplicate health conditions (n=68), a total of 105 unique health conditions remained (Figure 6).

Figure 6 – Workflow for the cleaning of health conditions from the Belgian call for proposals and the Belgian Burden of Disease (BeBOD) study



After combining health conditions identified through the BeBOD study with those identified through the Belgian call for proposals, we had a total of 117 health conditions with potential high unmet needs (Table 4).

**Table 4 – List of the 117 identified health conditions with potential high unmet needs considered for the 2024-2026 NEED research projects (excl. long COVID)**

Achondroplasia	Cricopharyngeal dysphagia/dystonia
Acute disseminated encephalomyelitis	Cystic fibrosis
Adenomyosis	Drug use disorders
Attention deficit hyperactivity disorder & attention-deficit disorder	Dry eye syndrome
Adrenocortical carcinoma	Dyspraxia
Alcohol use disorder	Ehlers Danlos syndrome
Alpha-1 antitrypsin deficiency	Endometriosis
Alzheimer's & other dementias	Eosinophilic oesophagitis & eosinophilic gastrointestinal diseases
Amyotrophic lateral sclerosis	Epidermolysis bullosa
Angelman syndrome	Epilepsy
Angina pectoris	Fibromyalgia
Autism spectrum	Fluoroquinolone-induced tendinopathy
Cerebral arterio-venous malformations	Food allergies (food protein-induced enterocolitis syndrome & paediatric food allergies)
Bipolar affective disorder	Fragile X syndrome
Bladder cancer	Frozen shoulder
Brain cancer	Functional neurological disorders
Cerebrovascular disease	Gender incongruence of children/adolescents
Charcot-Marie-Tooth disorder	Gluten intolerance
Chronic fatigue syndrome	Gordon syndrome
Chronic obstructive pulmonary disease	Grave's disease
Cluster headache	Guillan-Barre syndrome
Coeliac disease	Hearing impairment
Complex regional pain syndrome	Heart failure
Congenital anomalies	Hereditary & mitochondrial myopathies
Congenital hyperinsulinism	Hereditary multiple osteochondromas
	Hereditary spastic paraplegia
	Huntington's disease



Hyperemesis gravidarum
Hypophosphatasia
Idiopathic mast cell activation syndrome
Idiopathic progressive myopathies
Idiopathic pulmonary fibrosis
Primary immunodeficiencies
Inflammatory polyarthritis
Irritable bowel syndrome
Ischaemic heart disease
Lipoedema
Low back pain
Lung cancer
Lyme's disease (with Bartonella)
Ménière's disease
Mycoplasma & chlamydia pneumoniae-induced disease
Narcolepsy
Neonatal encephalopathy
Noninsulinoma pancreatogenous hypoglycemia syndrome
Nontuberculous mycobacteria pulmonary disease
Obsessive compulsive disorder
Oesophageal atresia
Optic neuritis/Devic's disease
Osteoarthritis
Osteoporosis
Paediatric hypertension
Paediatric kidney failure
Paediatric primary chronic pain (juvenile fibromyalgia, chronic functional abdominal pain, complex regional pain syndrome)

Parkinson's disease
Perinatal depression
Personality disorders
Post-intensive care syndrome
Post-sepsis syndrome
Postural tachycardia syndrome
Prader-Willi Syndrome
Preterm birth complications
Primary lymphedema
Psoriasis
Pudendal neuralgia
Pulmonary fibrosis (silicosis)
Pulmonary hypertension
Pyruvate kinase deficiency
Rheumatoid arthritis
Ring chromosome 20 syndrome
Scabies
Schizophrenia
Self-harm
Sepsis and other infectious disorders of the newborn baby
Sickle cell
Sinusoidal obstruction syndrome / veno-occlusive disease
Sjögren syndrome
Small fiber peripheral neuropathy
Subacute sclerosing panencephalitis
Sudden infant death syndrome
Susac syndrome
Systemic autoinflammatory diseases (NLRP12)



Systemic lupus erythematosus
Systemic mastocytosis
Tourette's syndrome
Tinnitus
Trachea, bronchus, and lung cancers
Tuberous sclerosis
Unipolar depressive disorders
Urinary incontinence (post-prostate op)
Venous ulcers
Waisman syndrome

*Highlighted in pink are health conditions identified through the BeBOD study.
Highlighted in grey are health conditions that were identified both through the BeBOD study and the Belgian call for proposals.*

When looking by the International Classification of Diseases' chapters (ICD-11), the three disease groups with the highest number of submitted health conditions were: diseases of the nervous system, diseases of the musculoskeletal system and connective tissue, and developmental anomalies (Figure 7). There was also a balance between non-rare (55%) and rare health conditions (45%) (Figure 8).

Figure 7 – Distribution of health conditions by the most frequent disease (ICD-11 chapter) groups (≥5 health conditions)

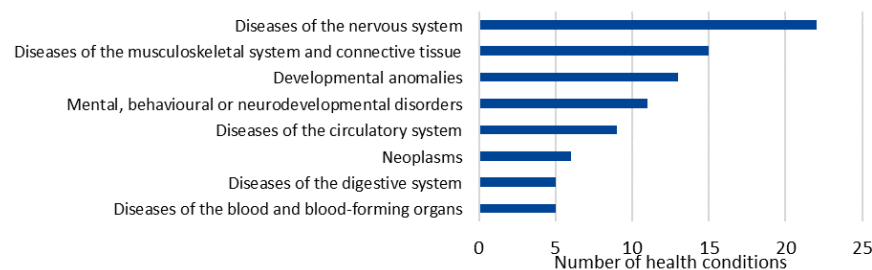
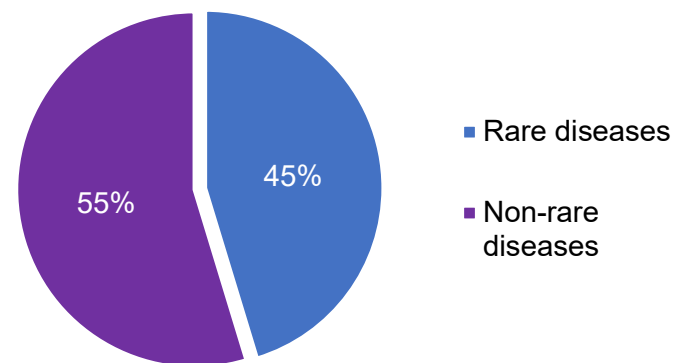


Figure 8 – Distribution of health conditions by rare disease status (n=117)



4.1.3 Using the European call for proposals to identify health conditions with potential high unmet needs in Europe (step 1b)

A total of 43 proposals were submitted following the European call for proposals. Two thirds of the proposals were submitted by individuals based in Belgium (38%), the Netherlands (21%) and France (17%) (Figure 9). The group that submitted the highest share of proposals was patients (48%) followed by healthcare professionals (36%; Figure 10).



Figure 9 – Distribution of submissions to the European call for proposals by submitter country

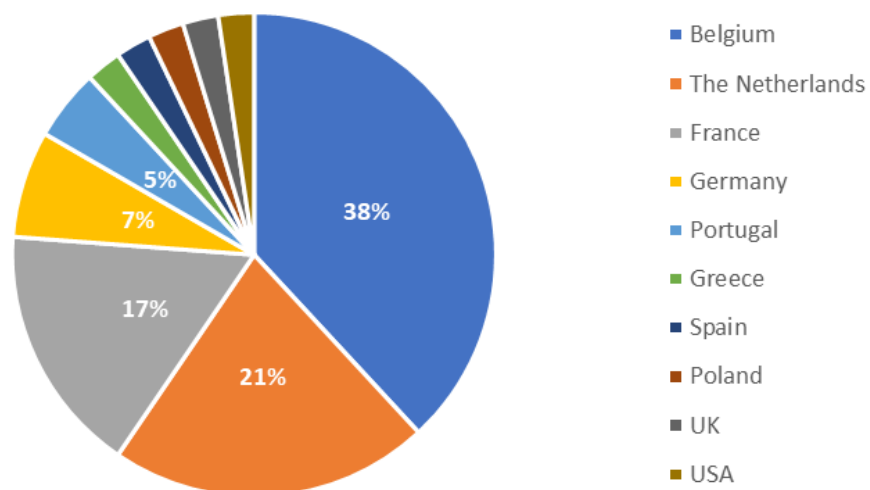
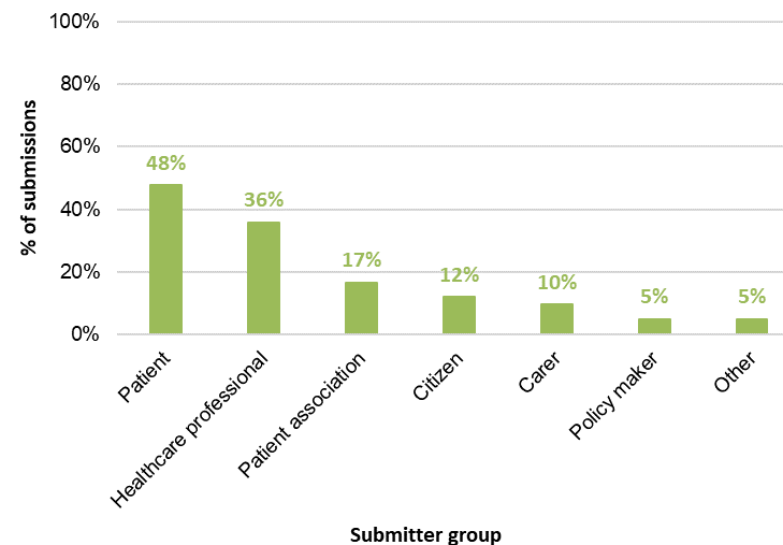


Figure 10 – Distribution of submissions to the European call for proposals by submitter group*



*Submitter groups are not mutually exclusive.

From the 42 submissions, 12 were related to long COVID. Similarly to the Belgian call for proposals, duplicate submissions were excluded. Consequently, through the European call for proposals, a total of 22 health conditions with potential high unmet needs were identified (Table 5), out of which 12 coincided with the Belgian list of identified health conditions (excluding long COVID, Table 4).



Figure 11 – Workflow for the cleaning of health conditions from the European call for proposals

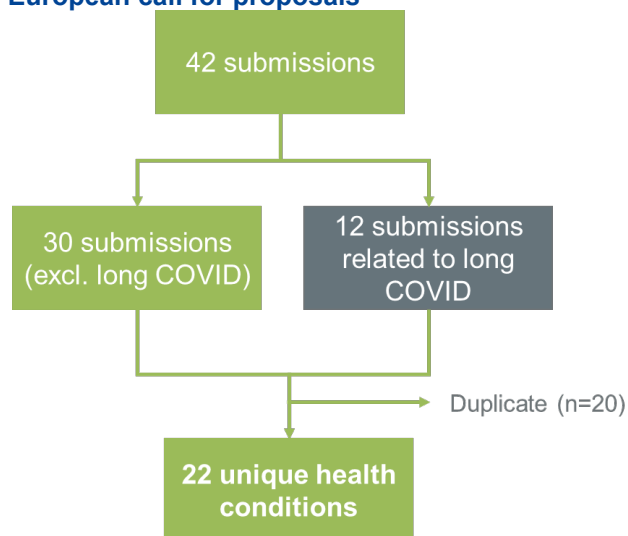


Table 5 – List of the 22 health conditions identified through the European call for proposals

Angelman syndrome
Cervical dysplasia
Chronic fatigue syndrome
Chronic kidney disease
Depression
Dry eye disease
Ehlers Danlos syndrome
Epilepsy (intractable)

Frozen shoulder
Huntington's disease
Inflammatory bowel disease
Long COVID
Menière's disease
Nontuberculous mycobacterial pulmonary disease
Orthostatic intolerance
Parkinson's disease
Postural orthostatic tachycardia syndrome
Primary immunodeficiencies
Progressive familial intrahepatic cholestasis
Ring chromosome 20 syndrome
Spinal muscular atrophy
Stiff person syndrome

4.2 Evaluation and selection of health conditions from the BeBOD study and the call for proposals (step 2)

4.2.1 Phase 1 evaluation of selection criteria

The Phase 1 overall average score of the 117 identified health conditions was 45.4 (range 0-100). The average score for the criterion "Impact on HRQoL" was 49.1 (standard deviation (SD) 27.8), for "Impact on life expectancy" 24.0 (SD 32.4), and for "Frequency" it was 63.1 (SD 32.2). Figures 11 and 12 show the distribution of Phase 1 average scores and Figure 13 shows the distribution of scores for the criteria "Impact on HRQoL", "Impact on life expectancy" and "Frequency", respectively.


Table 6 – Phase 1 overall and criterion-specific average scores (standard deviation) of the identified health conditions (range 0-100)

	Phase 1 overall	Impact on HRQoL	Impact on life expectancy	Frequency
All health conditions (n=117)	45.4 (18.4)	49.1 (27.8)	24.0 (32.4)	63.1 (32.2)
Non rare health conditions (n=65)	42.7 (17.9)	46.3 (26.5)	17.6 (29.1)	64.1 (35.3)
Rare health conditions (n=52)	48.8 (18.7)	52.6 (29.2)	32.1 (34.7)	61.8 (28.1)

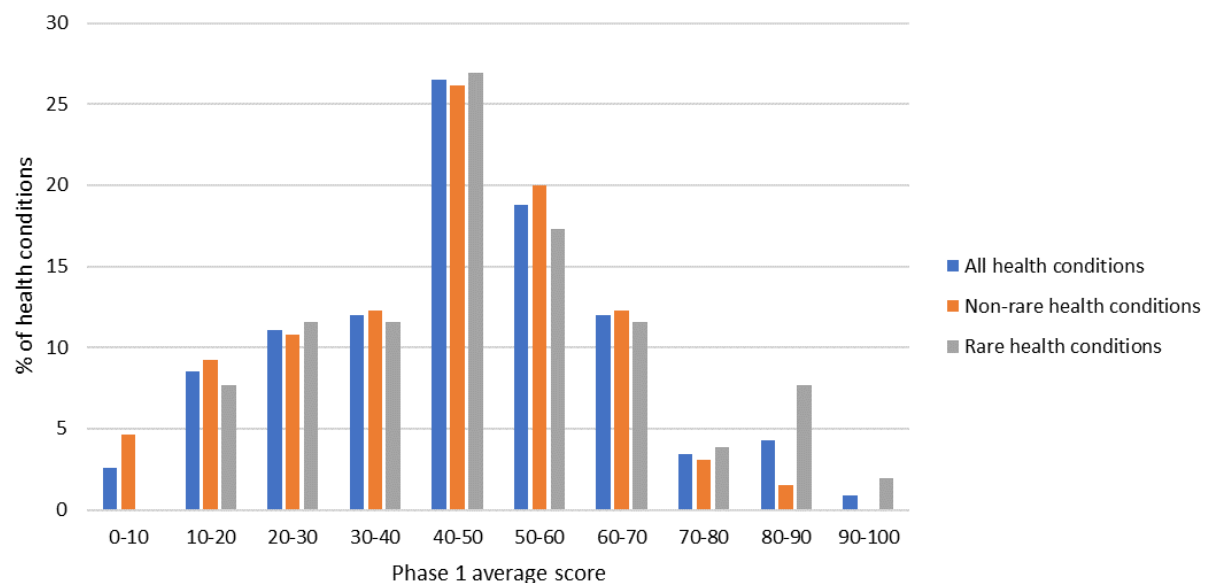
Figure 12 – Distribution of the identified health conditions by Phase 1 average score (range 0-100)


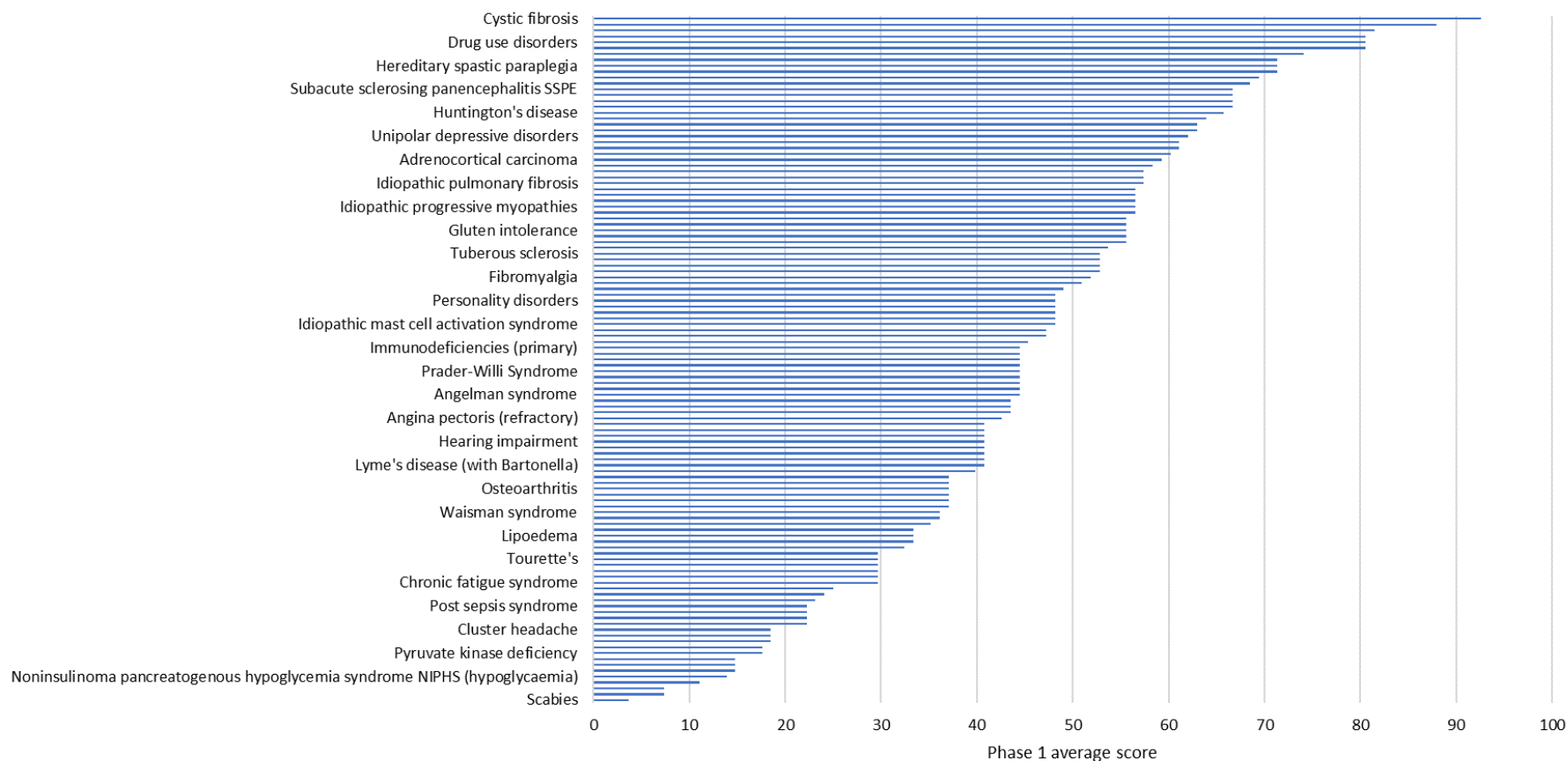
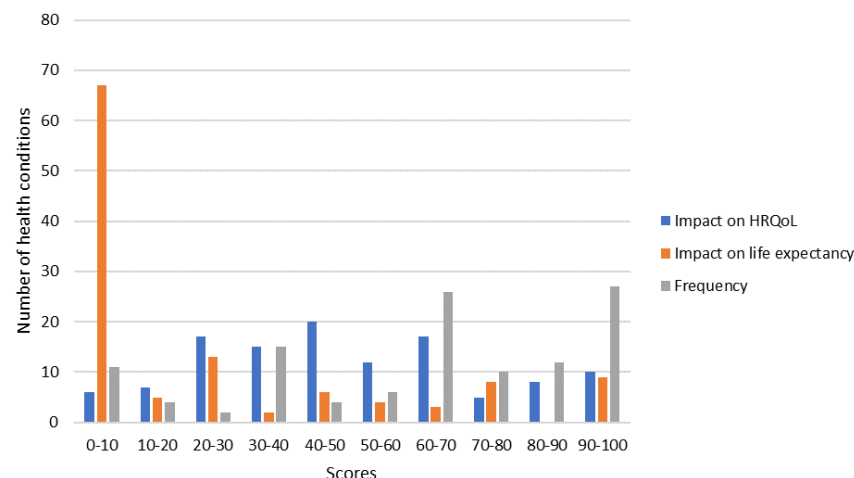
**Figure 13 – Distribution of identified health conditions by Phase 1 average score**



Figure 14 – Distribution of identified health conditions by the average score per criterion



Among the 117 health conditions evaluated, 27 health conditions had at least one Phase 1 selection criterion average score with a SD above 1. Following discussions with the research team about possible reasons for variations in scores (e.g. different data sources or quality of data), the scores for 26 of the 27 health conditions were adjusted for one health condition, the scores on the HRQoL criterion were not adapted as the evidence suggested the impact ranged from slight to extreme. For another health condition, the scores for the frequency criterion were adapted, but the SD of the average score remained above 1 due to insufficient evidence and a very large range of reported prevalences.

When shortlisting the eight non-rare health conditions with the highest overall average score, four neonatal conditions (neonatal encephalopathy

[birth asphyxia and birth trauma], sepsis and other infectious disorders of the newborn baby, congenital anomalies, preterm birth complications) were excluded due to concerns with feasibility of performing unmet needs research at this stage, as the tools for performing NEED research require further development for studies in paediatric populations. Table 6 and Table 7 outline the eight non-rare health conditions and the five^e rare health conditions that were shortlisted for Phase 2 evaluation, respectively.

Table 7 – Shortlist of the non-rare health conditions with the highest average score

Alcohol use disorder
Chronic obstructive pulmonary disease
Drug use disorders
Epilepsy
Inflammatory polyarthritis
Schizophrenia
Trachea, bronchus, and lung cancers
Unipolar depressive disorders

^e Five health conditions were shortlisted instead of four as two health conditions had the same Phase 1 average score.

**Table 8 – Shortlist of the rare health conditions with the highest average score***

Amyotrophic lateral sclerosis*
Brain cancer
Cystic fibrosis
Hereditary & mitochondrial myopathies
Sickle cell disease*

*Two health conditions had the same average score.

4.2.2 Phase 2 evaluation of selection criteria

Among the 13 shortlisted health conditions evaluated in Phase 2 (so including the criteria of economic impact and impact on vulnerable populations), five health conditions had at least one Phase 2 selection criterion average score with a SD above 1. For the criterion “Economic impact of the health condition on patients and on society”, the evaluation was mainly done from a societal perspective, as data on the economic impact on patients (i.e., out-of-pocket payments) were very limited. Following discussions with the research team, scores were adapted for all five health conditions. Table 8 and Table 9 outline the final ranking of the shortlisted non-rare and rare health conditions, respectively (Appendix 4, Table 8 and Table 9).

Table 9 – Ranking of the shortlisted non-rare health conditions based on overall score

Health condition
1 Drug use disorders
2 Schizophrenia
3 Alcohol use disorder
4 Trachea, bronchus, and lung cancers

5 Inflammatory polyarthritis
6 Unipolar depressive disorders
7 Epilepsy
8 Chronic obstructive pulmonary disease

Table 10 – Ranking of the shortlisted rare health conditions based on overall score

Health condition
1 Cystic fibrosis
2 Brain cancer
3 Amyotrophic lateral sclerosis
4 Sickle cell disease
5 Hereditary & mitochondrial myopathies

4.2.3 Selection of the two health conditions for NEED research

Following discussions with the team, the selected non-rare health condition was “**Schizophrenia**” and the selected rare health condition was “**Sickle cell disease**”. Bearing in mind that all shortlisted health conditions likely imply very high unmet needs, the health conditions prioritised for the 2024-2026 NEED research projects were selected based on feasibility, heterogeneity, and ongoing (R&D) initiatives. Indeed, we refrained from choosing health conditions for which the unmet needs are already widely known based on prognosis and survival data (e.g., amyotrophic lateral sclerosis), or those that have received more attention and advances in disease management in recent years (e.g., cystic fibrosis). As we also wanted to challenge the applicability of the NEED assessment framework to the greatest extent, we favoured health conditions for which data collection methods and analysis (step 3 in Figure 1) may be particularly challenging (e.g. mental health disorders), as well as different types of health conditions than those we have already studied (e.g. cancer).



The results from the application of this methodological procedure, including the two selected health conditions and the list of the 117 health conditions with potential high unmet needs identified through BeBOD study and the Belgian call for proposals (see Table 4), were shared with all submitters to the Belgian and European call for proposals, the national and international NEED advisory committees and the NEED steering committee. Results were also published on the NEED website.

5 DISCUSSION

In Phase 1 evaluation of health conditions, both patient needs criteria (“Impact on HRQoL” and Impact on “life expectancy”) and a societal need criterion (“Frequency”) were considered, while in Phase 2 evaluation, only societal needs criteria were considered. Alternatively, we could have had two rankings, one based solely on patient needs criteria (i.e. “Impact on HRQoL”, “Impact of life expectancy”) and based solely on societal needs criteria (i.e. “Frequency”, “Economic burden” and “Inequity”). In this case, non-rare and rare health conditions could have been ranked together. However, this would have required evaluating the “Economic burden” criteria for all health conditions, which is very challenging as data tend to be limited and very heterogenous across health conditions (e.g., different types of costs included, data years, and methods). Furthermore, for the 2024-2026 research projects, there was an important overlap between the 13 shortlisted health conditions in Phase 1 and the 20 health conditions with the highest average score for the two patient needs criteria only (Appendix 4 Table 13).

While the selection of health conditions for the NEED programme was conducted using a method that attempted to be as transparent and systematic as possible, it is also important to contextualise the assessment of unmet needs for the selected health conditions with clinical and field realities. Indeed, when developing the protocol of the NEED research projects, the scope of the selected health conditions should be discussed during the development of the patient recruitment strategy and in consultation with clinical experts. For instance, for practical or feasibility reasons, the scope may be broadened to include related health conditions or narrowed to a specific subtype.

The described procedure to identify, evaluate, and select health conditions with potential high unmet needs, generated several learnings that should be considered to improve the future procedure, being aware that some limitations might not be remediable.



1. We cannot claim that the Belgian list of identified health conditions covers all health conditions with potential high unmet needs. Nonetheless, two different sources were used to identify these health conditions, and the Belgian call for proposals was widely communicated through different organisations and channels (see section 3.1.2) to be as inclusive and comprehensive as possible. In contrast, the European list of health conditions relied solely on the European call for proposals, which was communicated less widely than the Belgian call.
 2. The health conditions identified through the call for proposals and the BeBOD study corresponded to different ICD levels. Health conditions identified through the BeBOD study tended to be defined at a higher level and encompass multiple conditions, while some of the health conditions submitted via the call for proposals were more specific, sometimes detailing a particular disease stage or characteristic (e.g. refractory). This discrepancy in the ICD level affected the score allocated to the different selection criteria. For instance, health conditions identified at a higher level tended to have higher prevalence.
 3. Evaluating the impact of a health condition on HRQoL is generally more subjective and uncertain than evaluating the other Phase 1 criteria. This can be explained by the use of different sources (e.g. general population for YLD/case vs. patients for self-reported HRQoL), differences in measurement methods for HRQoL (e.g. different instruments) across health conditions, as well as the varying perceptions of each evaluator. Typically, using only YLD data would often indicate a more severe impact on HRQoL compared to using self-reported HRQoL data. Ideally, a combination of both types of data should be used when evaluating this selection criterion.
 4. For rapidly fatal diseases, the “Impact on HRQoL” criterion may be less meaningful. Therefore, it is important to check for any highly fatal health conditions, as these may require a different appraisal.
 5. Although the duration and the age of onset of a health condition may have been implicitly considered when evaluating the impact on HRQoL, there was no explicit evaluation or scoring for these aspects.
 6. Evaluating health conditions with substantial heterogeneity in the impact of HRQoL and life expectancy across patients (e.g., with a small proportion of patients having very severe disease causing death at birth while others tend to have no impact on life expectancy) was particularly challenging. Although we tried to consider the average impacts across patients, relevant data on the distribution of patients across different disease sub-types were not always available.
 7. When additional information was collected by NEED researchers on the selection criteria, no systematic review of the literature for each health condition or quality appraisal of the evidence was conducted. As a result, for some health conditions, evidence for certain criteria was missing because it could not have been found or might not have been the most recent, representative or accurate.
 8. The importance of the selection criteria in Phases 1 and 2 was considered equal and all criteria were assigned equal weights (= 1). This is not a limitation per se but may be subject to debate.
- Despite these limitations, the method we developed to identify, evaluate and select health conditions can inspire other health condition selection procedures, such as horizon scanning initiatives and the development of High Impact Reports, or the annual NIHDl’s list of unmet medical needs^f.
- In the future, several aspects of this methodological procedure and its application could be improved.

^f <https://www.inami.fgov.be/fr/themes/soins-de-sante-cout-et-remboursement/les-prestations-de-sante-que-vous-rembourse-votre->

[mutualite/medicaments/remboursement-d-un-medicament/besoin-medical-non-rencontre-unmet-medical-need](https://www.mutualite.be/fr/themes/medicaments/remboursement-d-un-medicament/besoin-medical-non-rencontre-unmet-medical-need) (last consultation: 18 November 2024)



In step 1 on the “Identification of health conditions with potential high unmet needs”:

- Orphanet⁹, a database specific to rare diseases, could be used to identify rare health conditions and complement the BeBOD study.
- Alternative national or European data sources that could be used are: hospital discharge data, health survey data, surveillance data for communicable diseases or/and disease-specific mortality data.
- More time should be allocated to the dissemination of the European call for proposals among umbrella patient organisations and healthcare professionals’ organisations in each European country.

In step 2 on the “Evaluation and selection of health conditions from the BeBOD study and the call for proposals”:

- Health conditions submitted from the Belgian call for proposals could be evaluated for the specific disease stage mentioned in the submission, rather than overall, to better align with the submissions and gain in specificity.
- When ranking health conditions in Phases 1 and 2, weights could be applied to the selection criteria and a multi-criteria decision analysis (MCDA) approach could be implemented. For instance, the criteria weights derived from the general public in the KCE Report 272 could be applied, ensuring that the selection criteria evaluated match those in the Belgian MCDA approach.⁵
- To expedite Step 2, which is time- and resource-intensive, Phase 2 which evaluates the selection criteria “Economic impact of the health condition on patients and on society” and “Impact of the health condition on vulnerable populations” could be omitted.

⁹ <https://www.orpha.net/> (last consultation: 18 November 2024)



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■ APPENDICES

APPENDIX 1. TEMPLATE BELGIAN CALL FOR PROPOSALS (ENGLISH VERSION)

CALL FOR PROPOSALS: IDENTIFICATION OF UNMET NEEDS VIA THE NEED PROJECT

Health conditions or diseases for which there is no effective treatment, those for which the treatment has numerous side effects, or those diagnosed late... these realities lead to unmet health-related needs. To guide health policy and healthcare innovation in the right direction, it is essential to identify these unmet needs. These needs can be considered from both the perspective of the patient and that of society.

The Belgian Health Care Knowledge Centre (KCE) and Sciensano have launched a joint project called "NEED" (Needs Examination, Evaluation, and Dissemination). This project aims to identify unmet health-related needs associated with a specific health condition.

As part of this call, we invite you to propose a health condition or disease. Your proposal should describe which unmet needs deserve to be analysed. Following this call, two health conditions will be selected for an in-depth analysis of unmet needs in Belgium and a list of eligible topics (but not selected in 2024) will be published on the NEED website.

The ultimate aim of the project is to develop a European database containing scientific evidence on unmet needs in different types of health conditions. This database could be used by policy-makers, researchers, healthcare providers, etc. to guide, for example, policy decisions likely to improve patients' quality of life, investment decisions in the development of new treatments, or treatment choices.



You will notice that some of the questions will ask whether you can provide quantitative data (numbers), which would be valuable additional information. Wherever possible, please provide us with data for Belgium. Data stored within a patient organisation's internal documents can also be cited as an information source. If there is no data for Belgium, you can provide us with data at the European level or for other European countries, specifying the source. Providing quantitative data is optional and can be omitted if you do not have access to such information

If you do not have information on certain aspects of the health condition, please state so (e.g. write "I don't know"). However, the more information you provide, the better we will be able to assess the unmet needs related to the health condition.

Affiliation(s) of the person submitting the health condition proposal

All proposals will be assessed anonymously. This information will be used to inform you about the results of the call for proposals.

- First name:
- Last name:
- Email address:
- Country of residence:
- This call for proposals is intended for institutions/individuals with no commercial interests. Please indicate your affiliation(s)/role(s):
 - Patient
 - Patient organisation
 - Informal caregiver
 - Researcher
 - Healthcare professional
 - Policy maker
 - Citizen
 - Other (please specify) : _____

Information about the proposed health condition

1. Name the health condition (**which can be a disease, a disorder, or a syndrome**).

Disease groups and non-specific health conditions (e.g. cancer, falls, low back disorder, neck disorder, or prostate problems), **symptoms**, and **health conditions with no diagnosis** will be excluded, because they do not allow to identify the relevant patients and their specific needs.

2. Is the health problem considered a rare disease? (A condition is called rare if it occurs in less than 1 in 2,000 people)

- Yes
- No
- I don't know

3. Briefly describe the health condition (e.g. affected organs/body parts, symptoms, causes, typical age of onset).

4. Why do you think that this health condition is particularly relevant for the NEED call for proposals?

For example, does the health condition have an important impact on patients' quality of life or on their life expectancy? Is it a very frequent health condition? Is the treatment/management of the condition very burdensome or not very effective? Does the health condition have an important economic impact on patients and/or on society? Does the health condition specifically affect a vulnerable group of the population? You can also mention any other reason for which you believe that the health condition is relevant for the NEED call for proposals.



Impact of the health condition on patients' quality of life

We are interested in the impact of the health problem on patients' quality of life **despite the current management of disease**.

5. Describe the impact of the health condition (if any) on different aspects of patients' quality of life **despite the current management of disease**.

If you have access to quantitative data on the impact of the health condition on the different aspects of patients' quality of life, please provide these data and their sources. If data for Belgium are unavailable, please provide data for other European countries.

Aspects of quality of life include, for example, pain/discomfort, mental health (e.g. emotions, anxiety, worry, depression), mobility (e.g. ability to walk, move, or practice a physical activity), self-care (e.g. ability to wash, dress, maintain personal hygiene, and eat/drink), and usual activities (e.g. work, study, housework, family, or leisure activities).

Impact of the health condition on patients' life expectancy

This section is about the impact of the health condition on patients' life expectancy, **given current management of disease**. Life expectancy is the average period that a person may expect to live.

6. Describe the impact of the health condition on patients' **overall life expectancy**. If you have access to quantitative data on the impact of the health condition on life expectancy, on **disease-specific mortality** or **case-fatality**, please provide these data and their sources. If data for Belgium are unavailable, please provide data for other European countries.
7. If you have additional comments related to the impact of the health condition on life expectancy, please share them here.

Frequency of the health condition

8. Describe **how often** the health condition occurs in the general population. If you have access to quantitative data on the **frequency** of the health condition (prevalence and/or incidence), please provide these data and their sources. If data for Belgium are unavailable, please provide data for other countries.
9. If you have additional comments related to the frequency of the health condition, please share them here.

Accessibility, effectiveness, and burden of the overall management of the health condition

The overall management of the health condition covers the combination of interventions prescribed or carried out by healthcare professionals to either cure a health condition, ease symptoms, or prevent complications. This can include medicines, surgery, psychological therapy, or other clinical interventions (e.g. physiotherapy).

10. Describe **the management of the health condition** in Belgium, including for example medication, surgery, psychological therapies or other clinical interventions used.
11. Describe **any problems related to the accessibility of health interventions performed as part of the current management** of the health condition in Belgium. Accessibility can be defined as the ease of access to healthcare services, both physically and in terms of cost, time and availability of healthcare services and availability of qualified staff.

If you have access to quantitative data (figures) on the problems related to the accessibility of current management of the health condition in Belgium, please provide us with these data and their sources.



12. Briefly describe **the effectiveness of the current management strategy/ies** of the health condition, including the effectiveness of medication, surgery, psychological therapies or other clinical interventions. If you have access to quantitative data on the effectiveness of the current management of the health condition, please provide these data and their sources.

13. Indicate if, overall, the management of the health condition is burdensome:

*For example, the management of the health condition can be burdensome due to its **side-effects**, its **administration route** (e.g. oral, injection), its high **frequency of use**, and/or the **logistics** of receiving it (e.g. having to go to a specific hospital, having to store treatment in a fridge).*

- Very burdensome
- A little burdensome
- Not burdensome
- I don't know

14. Describe **in what way** the management of the health condition can be burdensome. If you have access to that information, please provide the sources used. (*Only appears if "very burdensome" or "a little burdensome" is selected*)

15. If you have additional comments related to the accessibility, effectiveness and/or burden of the management of the health condition, please share them here.

Financial and economic impact of the health condition

This section is about the financial and economic impact of the health condition, which includes the impact on patients, carers, the healthcare system and on the wider society.

16. Describe the financial impact of the health condition on **patients**. If you have access to quantitative data on the financial impact of the health condition on patients, please provide these data and their sources. If data for Belgium are unavailable, please provide data for other European countries.

*The financial impact **on patients** can include costs of treatment as a whole, costs of consultations, costs of hospitalisations, costs of transport to receive care, costs of additional childcare, reductions in household income, and interruptions to education.*

17. Describe the economic impact of the health condition on **society**. If you have access to quantitative data on the economic impact of the health condition on society, please provide these data and their sources. If data for Belgium are unavailable, please provide data for other European countries.

*The economic impact **on society** can include costs on the healthcare system, productivity losses, and costs for informal carers.*

18. If you have additional comments related to the financial and/or economic impact of the health condition, please share them here.

Impact of the health condition on vulnerable populations

19. Does the health problem affect any **vulnerable population(s)** in a different way? If so, please specify which one(s) and describe how they are affected (for example in terms of the impact of the health condition on quality of life and life expectancy, the frequency of the health condition, the effectiveness and burden of the management of the health condition, and/or the financial or economic impact of the health condition).

If you also have access to quantitative data on how the health problem affects **vulnerable population(s)**, please provide these data and their sources.



20. If you have additional comments related to the impact of the health condition on **vulnerable population(s)**, please share them here.

Thank you for taking the time to complete this form and for helping to identify unmet health-related needs.

Your proposal will be evaluated according to a specific procedure by the researchers of the NEED team. You will be notified by email of the final selection of health conditions for the NEED research programme. If you have any questions or require further clarification, please contact: info@kce.fgov.be.

To stay informed about the progress of the NEED project, we invite you to subscribe to the NEED newsletter on our website: <https://health-needs.eu/index.php/en>.



APPENDIX 1. LIST OF CONTACTED BELGIAN ORGANISATIONS FOR THE 2024 NEED CALL FOR PROPOSALS

Type	Organisation name	Acronym
Dentists	Vlaamse Beroepsvereniging van Tandartsen	VBT
Dentists	Verbond der Vlaamse Tandartsen	VVT
Dentists	Vlaamse Wetenschappelijk Vereniging voor Tandheelkunde	VWVT
Dentists	Société de Médecine Dentaire	
Public social security institution	CATT/CAIT-Commissie voor advies in geval van tijdelijke tegemoetkoming voor het gebruik van een geneesmiddel / Commission d'avis en cas d'intervention - RIZIV-INAMI temporaire dans l'usage d'un médicament	
Public social security institution	Het Observatorium voor de chronische ziekten / L'Observatoire des maladies chroniques - RIZIV-INAMI	
GP association	Société Scientifique de Médecine Générale	SSMG
GP association	Flemish association of general practitioners.	Domus Medica
GP association	Fédération des associations de médecins généralistes de la région wallone	FAGW
GP association	Fédération des Associations de Médecins Généralistes de Bruxelles	FAMGB
GP association	Algemeen Syndicaat van Geneeskundigen van België	ASGB
GP association	Syndicat des Médecins Généraux Francophones	GBO
GP association	Fédération des Maisons médicales	FMM
Midwives	Vlaamse Beroepsorganisatie van Vroedvrouwen	VBOV
Midwives	Union Professionnelle des Sages-femmes Belges	UPSfB
Mutualité /mutualiteit	Alliance nationale mutualités chrétiennes / Landsbond christelijke mutualiteiten	LCM - ANMC
Mutualité /mutualiteit	Union mutualités libres / Landsbond onafhankelijke ziekenfondsen	UNMlibres - MLOZ
Mutualité /mutualiteit	Union nationale mutualités socialistes / Nationaal verbond socialistische mutualiteiten	UNMS / NVSM



Type	Organisation name	Acronym
Mutualité /mutualiteit	Union nationale mutualités neutres / Landsbond neutrale ziekenfondsen	UNMN /LNZ
Mutualité /mutualiteit	Caisse auxiliaire d'assurance maladie-invalidité / Hulpkas ziekte-en invaliditeitsverzekering	CAAMI / HZIV
Nurses association	General Union of Belgian Nurses	AUVB-UGIB-AKPV (NL)
Nurses association	Federation nationale des infirmières de Belgique	FNIB
Nurses association	Beroepsorganisatie voor verpleegkundigen	NVKVV
Nurses association	L'Association belge des praticiens de l'art infirmier	ACN
Nurses association	Fédération de l'Aide et des Soins à Domicile	FASD
Nurses association	Nederlandstalig Platform voor Thuisverpleegkundigen	NPTV
Nurses association	Federale Neutrale Beroepsvereniging voor Verpleegkundigen	FNBV
Occupational therapists	Ergotherapie Vlaanderen	
Occupational therapists	Union Professionnelle des ergothérapeutes	UPE
Occupational therapists	Nationale Belgische Federatie van Ergotherapeuten- Fédération Nationale Belge des Ergothérapeutes	NBFE-FNBE
Other	Fondation contre le Cancer	
Other	Fondation Roi Baudouin	
Other	Gezond Leven	
Other	Kom OP Tegen Kanker	
Other	Médecins du Monde	
Other	Open vereniging van, voor en door senioren (Director Cel advocacy)	
Palliative care	Federatie Palliatieve Zorg Vlaanderen	FPZV
Palliative care	Fédération Wallonne des Soins Palliatifs	FWSP
Palliative care	Fédération Bruxelloise Pluraliste de Soins Palliatifs et Continus	FBSP
Patient association	LUSS	LUSS



Type	Organisation name	Acronym
Patient association	Kick Cancer	
Patient association	Patient Expert Center	PEC
Patient association	Rare Diseases Organisation Belgium	RaDiOrg
Patient association	Rare Disorders Belgium	RDB
Patient association	Vlaamse Patiëntenplatform	VPP
Patient association	Kinderkankerfonds	
Patient association	Ligue Alzheimer	
Physician association	Belgische Vereniging van Artsensyndicaten / Association Belge des Syndicats Médicaux	BVAS-ABSYM
Physician association	Groupeement Belge des Spécialistes	GBS-VBS
Physician association	Flemish Network Rare Diseases	
Physician association	Thyroid Club	
Physician association	Fonds des Affections Respiratoires	FARES
Physician association	Belgian Society of Cardiology	BSC
Physician association	Diabetes Liga/Association Diabète	DL / AD
Physician association	Belgian Brain Council	BBC
Physician association	Belgian Society of Radiology	BSR
Physician association	Belgian Society of Medical Oncology	BSMO
Physician association	College Genetics	
Physician association	Belgian Society of Pathology	BSP
Physician association	Belgian Society of Allergy and Clinical Immunology	BeISACI
Physician association	Belgian Society for Neurosurgery	BSN
Physician association	Belgian Neurological Society	BNS
Physician association	Royal Belgian Society for Surgery	RBSS



Type	Organisation name	Acronym
Physician association	Belgian Endocrine Society	BES
Physician association	Belgian Society of Gastrointestinal Endoscopy	BSGIE
Physician association	Belgian Hematology Society	BHS
Physician association	Collège Royal des Gynécologues Obstétriciens de Langue Française de Belgique	CRGOLFB
Physician association	Vlaamse Vereniging voor Obstetrie en Gynaecologie	VVOG
Physician association	Belgian Society for Infectiology and Clinical Microbiology	BVIKM/SBIMC
Physician association	BELGIAN SOCIETY OF INTERNAL MEDICINE	BVIG-SBMI
Physician association	Belgian Society for Paediatrics	BVK/SBP
Physician association	Belgian Academy of Paediatrics	BAOP
Physician association	Belgian Ophtalmic Associations	
Physician association	Royal Belgian Society for Oto-Rhino-Laryngology, Head and Neck Surgery	
Physician association	Belgian Respiratory Society	BeRS
Physician association	Belgian Association for the Study of the Liver	BASL
Physician association	Belgian Orthopaedic Trauma Association	BOTA
Physician association	Belgische Vereniging voor Orthopedie en Traumatologie	BVOT
Physician association	Belgian Association of Paediatric Orthopaedics	BAPO
Physician association	Belgian federation of Psychologists	BFP FBP
Physician association	Beroepsvereniging voor klinisch psychologen	VVKP
Physician association	Union Professionnelle des Psychologues Cliniciens Francophones & Germanophones	UPPCF
Physician association	Royal Belgian Society of Rheumatology & Belgian Health Professionals in Rheumatology	KBVR-SRBR
Physician association	Société Belge FR de Psychiatrie et disciplines associées	SFPIJ
Physician association	Vlaamse vereniging voor Psychiatrie	VVP
Physician association	La Société Royale de Médecine Mentale de Belgique	SRMMB



Type	Organisation name	Acronym
Physician association	BELpREG pregnancy registry	BELpREG
Physician association	Belgian Association of public health (BAPH)	
Physiotherapists	Association de défense professionnelle de la kinésithérapie / Beroepsvereniging voor kinesitherapeuten	AXXON (FR)
Physiotherapists	Union des Kinésithérapeutes de Belgique	UKB
Speech therapists	Vlaamse Vereniging voor Logopedisten	VVL
Speech therapists	Union Professionnelle des Logopèdes Francophones	UPLF



APPENDIX 2. LIST OF CONTACTED EUROPEAN ORGANISATIONS FOR THE 2024 NEED CALL FOR PROPOSALS

Organisation name
AGE Platform
BEUC-European Consumer Organisation
EPF-European Patient Forum
EURODIS Rare Diseases Europe
Europa Donna Belgium
European Disease/Health Networks/Alliances/Societies
IPOPI-International Patient Organisation for Primary Immunodeficiencies



APPENDIX 3. LISTS OF EXCLUDED CAUSES/SUBMISSIONS

Table 11 – Excluded causes from the Belgian Burden of Disease study 2020

Causes	Reason(s) for exclusion
COVID-19	Not relevant for 2024
Vision loss	Symptom/health status with heterogeneous causes (e.g. CNS-level vs. eye level (retina, lens); infectious vs. trauma vs. degenerative disease)
Hearing loss	Symptom/health status with heterogeneous causes (e.g. congenital vs. acquired, CNS vs. peripheral)
Other neonatal disorders	Too broad
Other maternal disorders	Too broad
Interpersonal violence	Not a health condition
Maternal abortion and miscarriage	Not a health condition
Other transport injury	Not a health condition
Road injuries	Not a health condition
Drowning	Not a health condition
Exposure to mechanical forces	Not a health condition & too broad
Fire, heat and hot substances	Not a health condition
Unintentional injuries not classified elsewhere	Not a health condition & too broad
Poisonings	Too broad
Other chronic respiratory diseases	Too broad
Animal contact	Not a health condition
Gynecological diseases	Too broad
Other neurological disorders	Too broad
Other malignant cancers	Too broad
Endocrine, metabolic, blood, and immune disorders	Too broad
Other infectious diseases	Too broad
Hepatitis	Too broad & different causes (e.g. inflammatory vs. viral), acute vs. chronic



Causes	Reason(s) for exclusion
Other musculoskeletal disorders	Too broad
Adverse effects of medical treatment	Too broad
Foreign body	Not a health condition
Other digestive diseases	Too broad
Falls	Not a health condition
Other non-malignant neoplasms	Too broad
Environmental heat and cold exposure	Not a health condition
Acute COVID-19 infection	Not relevant for 2024
Skin and subcutaneous diseases	Too broad
Other cardiovascular and circulatory diseases	Too broad
Other nutritional deficiencies	Too broad
Diarrheal diseases	Too broad, different causes (e.g. infectious vs. inflammatory)
Urinary diseases and male infertility	Too broad
Exposure to forces of nature	Not a health condition
Indirect maternal deaths	Not a health condition
Late maternal deaths	Too broad
CNS: central nervous system	

**Table 12 – Excluded submissions from the Belgian call for proposals**

Submitted proposals	Reason(s) for exclusion
Recreational drug use	Not necessarily a health condition
List of symptoms	No diagnosis
Cancer & socioeconomic vulnerability	Not a health condition (relating to a group of conditions in specific population)
Cancer (terminal)	Too broad: group of conditions with specific attribute (stage)
Electromagnetic hypersensitivity	Not (yet) a recognised diagnosis
Anosmia - fatigue - pain in legs	No diagnosis (group of symptoms)
Rare diseases	Large group of conditions
Delivery by c-section	Not a health condition per se. Submission concerns the lack of safety in the structural organisation of delivery wards
Lower limb amputation	Not a health condition per se. Submission concerns an intervention (assessment of impact of physical activity after amputation)
Shortness of breath, nerve pain	No diagnosis
ATM-related cancers (breast, pancreas, prostate, colon)	Not a health condition per se. A genetic mutation leading to different health conditions (different types of cancer)
Psychiatric diseases	Too broad (and specific psychiatric conditions are included in call)



APPENDIX 4. LIST OF HEALTH CONDITIONS WITH THE HIGHEST AVERAGE SCORE

Table 13 – List of 20 health conditions (HC) with the highest average score for the patient needs criteria (Impact on HRQoL and life expectancy)

Health condition	Rarity	Appeared in top 8 non-rare and 4 rare HCs in Phase 1*
Sepsis and other infectious disorders of the newborn baby	Non-rare	X
Subacute sclerosing panencephalitis	Rare	
Cystic fibrosis	Rare	X
Neonatal encephalopathy (birth asphyxia and birth trauma)	Non-rare	X
Amyotrophic Lateral Sclerosis	Rare	X
Brain cancer	Rare	X
Ring chromosome 20 syndrome (epilepsy)	Rare	
Congenital & mitochondrial myopathies	Rare	X
Trachea, bronchus, and lung cancers	Non-rare	X
Epilepsy	Non-rare	X
Hereditary spastic paraplegia	Rare	
Optic neuritis/Devic's disease	Rare	
Adrenocortical carcinoma	Rare	
Paediatric kidney failure	Rare	
Drug use disorders	Non-rare	X
Sickle cell	Rare	X
Lung Cancer	Non-rare	
Schizophrenia	Non-rare	X
Congenital anomalies	Non-rare	X

*Also includes health conditions (HCs) that were excluded due to feasibility concerns.