Unmet needs across Europe: disclosing knowledge beyond the ordinary measure

Luís Moura Ramos, Carlota Quintal, Óscar Lourenço, Micaela Antunes

PII: S0168-8510(19)30233-7

DOI: https://doi.org/10.1016/j.healthpol.2019.09.013

Reference: HEAP 4156

To appear in: *Health policy*

Received Date: 20 May 2018

Revised Date: 23 September 2019

Accepted Date: 24 September 2019

Please cite this article as: Ramos LM, Quintal C, Lourenço Ó, Antunes M, Unmet needs across Europe: disclosing knowledge beyond the ordinary measure, *Health policy* (2019), doi: https://doi.org/10.1016/j.healthpol.2019.09.013

TITLE – Unmet needs across Europe: disclosing knowledge beyond the ordinary measure

Author names and affiliations:

Luís Moura Ramos[a] (corresponding author); email: lmramos@fe.uc.pt; telefone: +351239790528

Carlota Quintal[ab]; email: qcarlota@fe.uc.pt

Óscar Lourenço[a]; email: osl@fe.uc.pt

Micaela Antunes[a]: email: micaela@fe.uc.pt

a: CeBER, The Centre for Business and Economics Research, Faculdade de Economia da Universidade de Coimbra, Av. Dias da Silva, 165, 3004-512 COIMBRA, PORTUGAL

b: CEISUC, Centre for Health Studies and Research of the University of Coimbra, Faculdade de Economia da Universidade de Coimbra, Av. Dias da Silva, 165, 3004-512 COIMBRA, PORTUGAL

Highlights

- Decomposing unmet needs indicator unveils information regarding access to healthcare
- Prevalence of needs is an important definer of health systems' attainment prospects
- Prevalence of unmet accounting for need is more prone to cross-country comparisons
- The interrelation of unmet needs and needs is represented by isolines

Abstract

Unmet healthcare needs (or foregone healthcare) is a widely used intermediate indicator to evaluate healthcare systems attainment since it relates to health outcomes, financial risk protection, improved efficiency and responsiveness to the individuals' legitimate expectations. This paper discusses the ordinary measure of this indicator used so far, prevalence of unmet needs in the whole population, based on the level of healthcare needs among the population. The prevalence of needs and the prevalence of unmet needs among those in need are key aspects that have not yet been fully explored when it comes to foregone healthcare. We break down the ordinary measure into prevalence of

needs and prevalence of unmet needs among those in need based on data taken from the European Social Survey 2014. Afterwards, we analyse these different measures in a cross-country perspective. We also discuss the link between them and the implicit relative assessment of healthcare systems considering the whole population and the sub-group of the population aged 65 or more. Comparisons across countries show different attainment levels unveiling varying challenges across European countries, depending on the combination of levels of need and levels of unmet needs for those in need.

Keywords: Unmet healthcare needs; European Social Survey; attainment of healthcare systems; cross-country comparison.

1. Introduction

Access to healthcare is a major concern of health policy in European countries and it is central to the assessment of health systems around the world [1,2]. One strategy frequently used to measure access is self-assessed foregone healthcare, i.e. subjective unmet needs (SUN). Unmet needs have been defined as the differences between those services judged necessary to deal appropriately with defined health problems and those services actually being received by individuals with such health problems [3]. SUN might be affected by availability (and affordability) of resources (supply side) but it can also be demand-driven. Moreover, as SUN is a self-reported outcome, it is vulnerable to cultural factors and individuals' expectations [4,5]. Prevalence figures for unmet needs across European countries have been based on the number of individuals reporting unmet needs, usually in the last 12 months, in relation to the total population [4,6-10]. Along these lines, two countries with the same population and the same number of people reporting unmet needs will show similar prevalence levels of unmet needs. However if one country has a larger population in need than the other, the higher prevalence of needs among the population is not captured by this measure.

Consequently, the indicator used so far (unmet needs in the whole population), might produce the same result for quite different situations. This raises some issues regarding cross-country comparisons. This paper discusses such issues by presenting and discussing alternative prevalence measures for SUN, based on data from the European Social Survey, 2014 [11]. We also address the relationship between those measures and the implicit assessment of health systems.

Unmet healthcare needs and the assessment of health systems

According to the World Health Organization (WHO) [12,13], health systems are expected to be affordable, equitable, accessible, sustainable and of good quality, among other virtues. However, desiderata such as accessibility are regarded as a means to an end; ultimately four overall main goals must be considered in assessing health systems: improved health, responsiveness, social and financial risk protection and improved efficiency.

In this framework proposed by the WHO [12,13], the existence of unmet healthcare needs, vis-à-vis its link to the intermediate goal of access, jeopardizes the attainment of all goals identified above. Firstly, concerns with unmet needs are primarily justified by the health consequences of systematic under and late utilisation of healthcare; those who forego care may end up with even worse health problems [5]. Recent evidence does indeed suggest that SUN is associated with a deterioration in subsequent health status [14,15]. Secondly, potential patients are more likely to seek and utilise care if they anticipate being treated well [12]. As unmet needs are possibly demand-driven, they can be fostered by poor responsiveness. This concept concerns the way people are treated and the environment in which they are treated when seeking healthcare. There is

evidence that negative past experiences of chronically ill individuals with the healthcare system are strong predictors of unmet needs [16]. Thirdly, more fairly distributed financing reduces the risk of unmet needs due to high healthcare cost [12]. Hence, unmet needs can also be an indication of health system failure to protect against financial hardship. Finally, although some unmet needs are expected if resources are efficiently allocated [17], the deterioration of health among those who forego needed care might result in the escalation of treatment costs, which is counterproductive from the standpoint of efficiency.

Summing up, unmet healthcare needs are important for assessing the main purposes of any developed and modern health system. However, addressing this issue raises a challenging question: how to empirically assess the extent of unmet healthcare needs in health systems?

Self-reported measures of unmet needs have been adopted in recent research on this topic [3-4,18]. In the self-reported approach, patients are assumed to be the best assessors of their health status. They also know whether they have received the medical care judged necessary [19]. In the literature, the prevalence of unmet needs across European countries has been estimated based on the number of self-reported unmet needs, usually in the last 12 months, compared to the total population (those who needed care and those who did not). Consequently, a health system can show a high attainment level (low prevalence of unmet needs) even if a large share of individuals in need were not provided due care. In this case, for health system assessment purposes only reducing the number of people having unmet needs matters. The larger the proportion of people without unmet needs the better health systems perform. However, some of the people without unmet needs did not have any need at all and still contribute to a better assessment of health systems. Consequently, this methodology implicitly

assumes that health systems played a role even in the cases where no healthcare need emerged (in the last 12 months). To some extent, this is suitable given the link between past unmet needs and current health. Consequently, from a long run perspective such prevalence measure is acceptable. While in the short run almost all input factors and external constraints can be fixed (health systems can only use the resources created in the past), in the long run many may be changeable [20]. In the long run, investment is partly something that healthcare system does – and as investments are long-lived, it has a responsibility to invest [12].

In spite of the link between healthcare and health, the emergence of healthcare needs depends on numerous factors besides healthcare [21]. The magnitude of needs faced by each health system also depends on variables it does not control. Thus, comparisons of unmet needs across countries which do not take into account their different levels of need might produce biased health system assessments, since countries face different challenges. To overcome this limitation, we propose a prevalence measure of SUN only based on the population in need. From the healthcare access standpoint, it is implicitly assumed that what matters most is to ensure that individuals already in need receive appropriate healthcare. In this context, foregone care among those in need can be viewed as an indicator more closely related to financial protection and responsiveness goals since price barriers and unfair treatment can discourage or even inhibit utilisation in each period.

Finally, as SUN is self-reported it will also capture expectations and attitudes towards health and healthcare. Lower prevalence of SUN might also mean that individuals do not acknowledge their poor health or they do not realize that their poor health is amenable to healthcare interventions [5]. Actually, the dimension of responsiveness proposed by WHO has the same limitations. Opinions of health system responsiveness

might be influenced by system features or the respondents' characteristics. The WHO [12] notes that poor people may have fewer expectations than rich and be more accommodative to unresponsive services. Therefore, responsiveness measures should correct these differences and the cultural differences between countries. However, the present paper does not deal with differences in expectations. It looks into the different levels of need among countries. This alone helps to unveil crucial information for the assessment of medical care access in the European countries analysed.

Our main goal is to provide a framework for future analyses and discussions on unmet needs. We intend, in particular, to highlight that the unmet needs indicator used so far might produce the same result for quite different situations in terms both of the levels of needs faced by healthcare systems and of meeting existing needs.

2. Materials and Methods

Data

The European Social Survey (ESS) instrument provided data for our analysis. The ESS is a harmonized cross-national survey that collects data on attitudes, beliefs and behaviour patterns of the European population [22]. To ensure comparability, all countries use random probability sampling. The samples are representative of all persons aged 15 and over, residing in private households in every country. All participant countries must target for a minimum 'effective achieved sample size' of 1,500 individuals, or 800 in countries with ESS populations of less than 2 million after discounting for design effects [23]. Information is collected in the field by a team of trained face-to-face interviewers, using a standardized interview methodology. The interview typically takes place in the respondent's home. Currently, there are eight

rounds of data from 2002 to 2016. The current paper uses data from round 7 conducted in 2014 (ESS7) [11].

The ESS questions are grouped into two main sections – a core section and rotating modules. The core section routinely collects information on a range of subjects, including individuals' characteristics, sociodemographic features and economic information. The contents of rotating modules vary across ESS waves. The ESS7 contains a rotating section on 'Social Inequalities in Health'. This module was designed to measure social determinants of health and health inequalities. An in depth description of the Survey can be found in the website of the survey, http://www.europeansocialsurvey.org/, as well as in [24,25].

Measures

The prevalence measure of subjective unmet needs is defined as the proportion of a particular population found to report an unmet need or forgone care during a given time period (usually one year) [4,18]. To measure a prevalence indicator it is crucial to define clearly both the event of interest (unmet needs in our case) and the population exposed to the event. In recent research looking into unmet needs, the population exposed to the event (population at risk) is usually defined as the whole study population, irrespective of needing medical care in the period of observation [7,26]. We refer to this unmet measure hereafter as SUN_w. In this paper, we propose an alternative prevalence measure of unmet needs referred to as SUN_n: the proportion of the population reporting unmet needs in a given time period, but restricting the population at risk to those who reported need for medical care in the same observation period. In fact, SUN_n and SUN_w are related to each other and to the prevalence of subjective healthcare needs (SN). It is a simple exercise to show that:

$$SUN_w = SN \times SUN_n$$

where:

$$SUN_w = \frac{\#\ reporting\ unmet\ needs}{Whole\ study\ population}$$

$$SN = \frac{\#reporting\ needs}{Whole\ study\ population}$$

$$SUN_n = \frac{\#\ reporting\ unmet\ needs}{\#\ reporting\ need}$$

The measurement of the number of individuals reporting unmet needs (# reporting unmet needs) was based on the following question included in the ESS survey: "*In the last 12 months, were you ever unable to get a medical consultation or the treatment you needed for any of the reasons listed on this card*?". The listed reasons are: Could not pay for it; Could not take the time off work; Had other commitments; The treatment you needed was not available where you live or nearby; The waiting list was too long; There were no appointments available; Other. The possible answers are 'Yes', 'No' and 'Don't know'. Those who answered 'Yes' are classified as the ones with unmet healthcare needs, providing the basis for estimating SUN_w. Those who answer 'No' or 'Don't know' are then submitted to a follow-up question: "*Was that because...*?', to which the respondent could answer in any of the following ways: a) '*Were able to get medical consultation or treatment needed*'; b) '*Did not need medical consultation or treatment*' and c) '*Don't know*'. This follow-up question made it possible to separate the population who need medical care from those who do not, and consequently calculate SN and SUN_n. By excluding from the whole population those individuals who chose to reply 'Did not need medical consultation or treatment' we were able to calculate the population with healthcare needs (# reporting needs).

The estimation of all prevalence measures per country uses the sample weights provided within the ESS dataset.

Chart analysis

Resorting solely to graphical analysis, it is possible to compare countries using the three prevalence measures (SUN_w, SUN_n and SN) in the same chart. We define a Cartesian coordinate system with the horizontal axis displaying the prevalence of unmet needs among those who had healthcare needs, SUN_n, and with the vertical axis showing the prevalence of medical care needs, SN. Whereas

$SUN_w = SN \times SUN_n <=> SN = SUN_w / SUN_n$

it is possible to draw lines of constant SUN_w in the plane SN x SUN_n, (referred to as $isoSUN_w$ lines). Each $isoSUN_w$ line is the set of all combinations of SUN_n and SN that produce a fixed value of SUN_w. The higher the level of SUN_w, the more distant the isoSUN_w line is from the origin. Figure 1 illustrates the unmet needs (SUN_w and SUN_n) and healthcare need status (SN) of three hypothetical countries, A, B and C.

[Insert Figure 1 about here]

The x-axis, running horizontally, represents the SUN_n variable and the vertical line intersecting it, identified as 'Average SUN_n', corresponds to the average prevalence of SUN_n in the whole sample of countries. The vertical y-axis represents the SN variable and the horizontal line intersecting it, identified as 'Average SN', corresponds to the average prevalence of SN in the whole sample. The downward sloping curved lines show the various combinations of SUN_n and SN that produce a given fixed level of SUN_w. We consider three isolines; the farther a given isoline is from the origin, the higher the prevalence of reported unmet needs, SUN_n. For example, considering the middle isoline, it is associated with a prevalence of SUN_w of 12%. In the example,

SUN_w in country A is slightly above 12% while it is exactly 12% in country C. Each dot on the chart conveys information on three variables: SUN_n, SN and SUN_w. For example, country C presents a prevalence of needs, SN, of roughly 62%, almost 20% of SUN_n and 12% of SUN_w. Country C is above the sample average in terms of SUN_n and below the sample average in terms of SN. On the other hand, country B has a prevalence of needs (SN) of 83%, SUN_n of approximately 24% and SUN_w of little less than 20%.

Countries A and C are practically on the same $isoSUN_w$ line, meaning that they have quite similar levels of unmet needs in the whole population. Nonetheless, they are located in opposite quadrants in Figure 1. Country A is above the sample average in terms of prevalence of needs (SN), but it is below the sample average in terms of foregone healthcare among those in need (SUN_n). Country C is in the opposite situation. Countries A and B, have similar levels of need prevalence (both are above average SN), but country A has a much lower level of SUN_n than B, which places it in a lower $isoSUN_w$ line as well.

3. Results

Figure 2 below presents the three measures discussed above for the countries included in the ESS. The estimated average values are reproduced in the Appendix together with the confidence intervals (CI).

[Insert Figure 2 about here]

The isoSUN_w line of 14.4% (dashed line) traces the average level of the population aged 15 or over across European countries that in 2014 reported unmet needs for

medical care. The proportion of people reporting unmet needs was highest in Poland (PL) (with a share of 22%), Israel (IL), France (FR) and Portugal (PT). Less than 6% of the population reported unmet needs in Austria (AT) and 4% in the Netherlands (NL). The self-reported nature of this information makes it permeable to factors such as perceptions, expectations and cultural differences that may affect responses to questions about unmet care needs; this requires caution when comparing the magnitude of inequalities across countries [27]. However, by breaking down the two components of SUN_w, it is possible to draw some conclusion about the countries' relative situation.

For instance, Austria (AT) and Hungary (HU) have the same level of SUN_w (6%), but their origins are quite different. Austria healthcare system faces a population with a high level of SN (81.4%), but with a low level of SUN_n, 7.1%. Conversely, a relatively low level of SN, 54.6%, coexists with a level of SUN_n of 11% in Hungary, higher than in Austria. So the SUN_w indicator hides noteworthy differences regarding the challenges these two healthcare systems may be facing. From the access standpoint, individuals in need (higher SN in Austria) get higher access rates, since they report a lower existence of unmet needs, SUN_n. The simple comparison of the SUN_w indicator between these countries would have hidden these considerably different situations.

Another feature that Figure 2 illustrates is that the countries with higher subjective healthcare needs, SN, Germany (DE), and Portugal (PT), are not the ones that present higher prevalence of unmet needs among those with needs, SUN_n (Poland (PL) and Israel (IL)). A different insight is possible when comparing countries with similar situations regarding SN, for instance Sweden (SE) and Israel (IL) both with around 64% of the population reporting healthcare needs. Their healthcare systems thus address populations with same level of healthcare needs. However, the different SUN_n in the

two countries (around 16% in Sweden and 30% in Israel) reveal different access attainment outcomes.

The different levels of SN 54.6% in Hungary (HU) and 87.7% in Germany (DE), may have different underlying reasons, including population health status (healthier populations have less healthcare needs), their age structure (an ageing population would have more healthcare needs) or even different expectations regarding healthcare system and subjective perceptions of healthcare needs.

In an attempt to remove the influence of the population age structure a similar representation is depicted in Figure 3 just considering the population aged 65 or over.

[Insert Figure 3 about here]

The average isoSUN_w (dashed line) considering only the population aged 65 or over is now 8.7% compared to 14.4% in Figure 2.

SN level rises to the interval between 70% in Sweden (SE) and 94% in Portugal (PT), and consequently the healthcare systems that have to respond to an elderly population are under more pressure than those facing younger age pyramids. Higher SN is associated with lower prevalence of SUN_w, that drop to 3% in Switzerland (CH) and 29% in Israel (IL).

Again, comparing countries in the same $isoSUN_w$ line reveals different situations faced by their health systems. Comparing the United Kingdom (GB) and Sweden (SE), both have SUN_w around 7.5%. However, the United Kingdom has a higher share of older population reporting healthcare needs (85% compared to 70% in Sweden), but a better attainment regarding the individuals who are in need, with a SUN_n of 8.8% compared to 10.9% in Sweden.

Also comparing countries with a similar prevalence of needs, SN, for instance the Netherlands (NL) and Finland (FI) with 79%, a different attainment of these two healthcare systems is apparent, since SUN_n in Finland is 20.5%, above that of the Netherlands (3.8%).

Figure 4 allows us to better compare the measures of unmet needs between individuals 65 years or over and the share of the population aged 15 or over. It draws the absolute difference between these two groups regarding the probability of facing unmet needs SUN_w, broken down into the variation of the prevalence of needs, SN, and the variation of the prevalence of unmet needs for those in need, SUN_n.

[Insert Figure 4 about here]

The first clear outcome has to do with the fact that the prevalence of needs, SN, is always higher among individuals aged 65 or more, when compared with the population aged 15 or over, as it can be read from the vertical axis. The only exception is Finland (FI) where SN has the same value for the elderly population and for the whole population. On the horizontal axis we see each country's relative attainment regarding the prevalence of unmet needs for those in need, SUN_n, among the elderly against the population aged 15 or over. In Lithuania (LT), Czech Republic (CZ), and Hungary (HU), SUN_n is higher for the older subgroup. These countries also present the most pronounced positive difference in terms of SN for the elderly. This is most demanding on the healthcare system. With the exception of these three countries and Slovenia (SI), the other countries register a lower prevalence of SUN_n for the elderly. The most expressive negative differences occur in Spain (ES) and Switzerland (CH).

4. Discussion

This paper sought to highlight that the prevalence measure of unmet needs in Europe, which has been used recently in the literature and health reports, can mask different situations in terms of both health systems attainment and future challenges for health services. Moreover, it also implies caution when cross-country comparisons are made.

By breaking down the usual measure of prevalence of unmet needs, our analysis identified countries such as Austria, Switzerland and Belgium. These countries have high levels of needs but their health systems are responding relatively well to those needs. Thus, in terms of future attainment, the healthcare system is working in the right direction and other policies should follow. Countries such as Portugal, France and Finland, on the other hand, have both high needs and unmet needs, anticipating further problems in the future. Thus, it is of utmost relevance to adapt health services to needs. Other areas of health determinants, however, must not be overlooked. There is another group of countries including the Netherlands, Sweden, Hungary and the Czech Republic, where both needs and unmet needs are low. These countries seem to be in the best position in this analysis, both in the short and in the long term. Finally, there are some countries such as Israel and Poland, which present a low level of needs, while unmet needs are high. Not only should health services be reinforced, but also should careful attention be paid to the evolution of needs, particularly, if these low levels are sustainable in the long run. Naturally, one cannot exclude variation in country positions in our analysis stems from differences in expectations and cultural factors. Nevertheless, high levels of reported needs and unmet needs due to higher expectations can not necessarily lead to worse health outcomes in the future. They do, however, represent pressure over health services and weak health system responsiveness.

Focusing on the elderly population, our results show on average, that they have lower levels of unmet needs. This had already been referred in the literature [3,7,16,26]. The higher prevalence of healthcare needs among the older population is, in most countries, accompanied by a decrease in unmet needs for those in need. This may result from better performance of most healthcare systems in dealing with the elderly. It may, otherwise, be associated with personal characteristics, namely the fact that older population may face less time constraints when seeking healthcare [16]. However, three countries, Lithuania, Hungary and the Czech Republic, stand out as having the worst relative prevalence of unmet needs for elderly individuals with healthcare needs. In these countries, this segment of the population has higher prevalence of healthcare needs than the whole population together with higher prevalence of unmet needs among those in need.

Comparing our study with previous literature is a limited exercise, since research on unmet needs has mainly been conducted in the United States and Canada [cf. 7,24,28,29]. Most works in Europe focus on a single country (such as the recent analyses referring to Ireland [18] and Turkey [30]). Others even focus on specific sub-groups of the population, such as children with special needs [31], disabled people [32] or HIV-infected patients [33], to quote just a few among the most recent works. Only a small number of studies that cover a large group of European countries have been carried out and their objectives have been to identify the main factors associated with unmet needs [4,6-10,29,34,35]. In some cases, prevalence figures for each country have been presented, but discussions are not on cross-country comparisons.

According to this evidence, people who report unmet needs tend to be in poorer health and have a lower income. Women, informal carers, immigrants, residents in urban areas and individuals who feel they were discriminated against or unfairly treated in the past

also tend to be at increased risk of unmet needs. The opposite is found among the older people. Mixed results have been found in people with different education levels.

In addition to individual characteristics, some studies also consider country level variables. One of these studies focused on Europe, using data from ESS round 7 [10]. It included two macro indicators in a regression analysis – physician density per 1000 people and out-of-pocket payments as a percentage of total health expenditures. Results suggest that these indicators do not affect overall unmet needs. In fact, while Poland appears with the lowest density (2.22) and the highest unmet needs (22.4), there are countries like Portugal with a high density of physicians (4.10) and a high level of unmet needs (18.4). Concerning out-of-pocket payments, the Netherlands has the lowest proportion of payments (5.22) and the lowest level of unmet needs (4.3). However, France has the second lowest share of out-of-pocket payments (6.34), but it also presents one of the highest levels of unmet needs (19.2). In another study [7], based on data from the 2009 European Statistics on Income and Living Conditions (EU-SILC), the authors found an inverse relationship between the share of household out-of-pocket payments in total health expenditure and unmet needs. However, like in [10], they did not find any evidence of the impact of the density of doctors or dentists as well as of the rules governing access to practitioners (free choice) and the existence of fee-for-service. Regarding the impact of income inequality, one study using data from EU-SILC (2008-2013) [9] analysed the effect of GDP and income inequality (S80/S20) on unmet needs due to costs, waiting lists and travel difficulties. The author found that income inequality and health access were associated, but only among the disadvantaged. This result was independent from the country's overall economic level. Social allowance policies also seem to contribute to healthcare system accessibility when it comes to low income families [8] or elderly people [34].

The weight of out-of-pocket payments and the physician density have been the main macro variables used in the few studies available with European samples [7,8,10] but, as shown, results are not clear cut. In other cases, the impact of country level indicators, such as income inequality and social benefits, is restricted to the poorest. Therefore, it is not an easy task to categorise groups of countries. Our disaggregated approach might be useful for this discussion. It provides some hints on which countries are at the same level of need and which countries are at the same level of unmet needs, among the population in need.

In future analyses, subject to data availability, it might be beneficial to break down the analysis further by types of reasons for unmet needs. In previous studies [4,6,7], Sweden, for instance, presented a level of unmet needs higher than the European average for all reasons. The level of unmet needs due to costs and availability was, however, lower, compared with the European average. In Sweden, the reason 'wait and see if problem got better on its own' (EU-SILC data) is more frequent. However, in the ESS questionnaire this reason was not explicit in the list of alternatives. Although it could be accommodated by the alternative response 'other', it might not have come up spontaneously.

The researchers involved in the development of the ESS round 7 point out that there are some limitations related to small sample sizes, making it difficult to study variation of unmet needs for different reasons between countries [10]. The same limitation has been mentioned in studies using EU-SILC. However, authors also argue that it seems unlikely that the results are grossly misleading because of sample bias [8]. The use of unmet need indicators to discuss health system attainment should be complemented by other measures, namely indicators related with financing. There might be individuals who do not forego healthcare, but they spend a large share of their budgets diverting

resources from other important goods and services. Also, there might be individuals who could afford healthcare, but they choose not to [26].

Finally, some important limitations of our analysis stem from the very nature of self-reported measures. As noted in the introduction, self-reported unmet needs are influenced by individuals' attitudes and expectations towards their own health and health services [5,26,36]. Moreover, a study on Canada [3] found that higher than expected use of health services was associated with reported unmet needs. Consequently, unmet needs may also partly represent dissatisfaction with the health system, which is in line with the education-gradient obtained in some studies [7,37]. Additionally, some of the unmet needs reported by respondents of ESS might have been clinically and objectively validated, but not all. Consequently, it might be the case that some of the perceived needs are actually needs for social care rather than healthcare [5,38]. Just as individuals might not recognise that their poor health is amenable to healthcare interventions, they can also overestimate what healthcare can do for them. The term 'effective unmet health care need' has actually been suggested for an unmet need that 'can plausibly be met by increasing the provision of healthcare' [5]. This means that all three measures used in this study, including the prevalence of needs (SN), have these limitations. Still, patient-reported measures of health system performance have been increasingly recognised as important tools if health systems are to become more knowledge-based and people-centred [39]. Thus, we anticipate that analyses based on subjective unmet needs will continue and develop. We believe that the approach proposed in this paper offers potential to guide future discussions.

5. Conclusions

Seeking to obtain healthcare, people report problems, which often reflect significant barriers to access health services. The percentage of people who self-report unmet needs is one of the indicators used to identify these potential barriers. We argue that breaking down the unmet needs measure, SUN_w, in two components - the prevalence of needs, SN, and the prevalence of unmet needs in the population in need, SUN_n - some hints on public policy measures to promote access can be found. The magnitude of needs faced by each health system, also determined by factors other than healthcare services, influences the healthcare system attainment capacity, limiting in the short run its ability to quell those needs. From an attainment perspective, it is thus promising to compare countries with similar prevalence of needs and analyse the prevalence of unmet needs, among those in need.

Also from a public policy perspective, countries with similar levels of unmet needs face different challenges related to the reasons for difficulties in accessing healthcare be it high prevalence of needs among the population and/or high prevalence of unmet needs among the ones in need. In the first case, a high level of need may invoke the need to rethink some social policies complementing the healthcare policy and focus on the functional organisation of the health system providing the required inputs and an adequate, fairly distributed financial support. In the second case, a high prevalence of unmet needs among those in need can be interpreted as an indicator of low health system attainment. A deep analysis of their different origins may help find the best policy mix in order to decrease this inequality, since in the countries unmet healthcare needs are consistently higher among economic and socially disadvantaged groups.

Notwithstanding, international comparisons are influenced by reporting differences concerning unmet needs, partly due to social norms and expectations. Moreover, measures of SUN might also capture the performance of public policies other than

healthcare. Thus, countries with equally performing health systems might present different levels of SUN, depending on their performance in areas besides healthcare. Therefore, disentangling the unmet needs measure provides some common ground for international comparisons and also indications for public policy recommendations.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Declarations of interest: none'.

Acknowledgements

The authors wish to thank three anonymous reviewers for their helpful comments and suggestions to improve the original version of the paper.

References

1. Levesque, J. F., Harris, M. F., & Russell, G. (2013). Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *International journal for equity in health*, *12*(1), 18.

2. Gauld, R., Raymont, A., Bagshaw, P. F., Nicholls, M. G., & Frampton, C. M. (2014). The importance of measuring unmet healthcare needs. *The New Zealand Medical Journal (Online)*, *127*(1404), 63.

3. Allin, S., Grignon, M., & Le Grand, J. (2010). Subjective unmet need and utilization of health care services in Canada: what are the equity implications?. *Social science & medicine*, *70*(3), 465-472.

4. Allin, S., & Masseria, C. (2009). Unmet need as an indicator of health care access. *Eurohealth*, *15*(3), 7.

5. Aragon, M. J., Chalkley, M., & Goddard, M. K. (2017). *Defining and measuring unmet need to guide healthcare funding: identifying and filling the gaps*. Centre for Health Economics, University of York.

6. Baert, K., & De Norre, B. (2009). Perception of Health and Access to Health Care in the EU-25 in 2007. *Eurostat Statistics in Focus 24/2009*, 1-12.

7. Chaupain-Guillot, S., & Guillot, O. (2015). Health system characteristics and unmet care needs in Europe: an analysis based on EU-SILC data. *The European Journal of Health Economics*, *16*(7), 781-796.

8. Israel, S. (2016). How social policies can improve financial accessibility of healthcare: a multi-level analysis of unmet medical need in European countries. *International journal for equity in health*, *15*(1), 41.

9. Elstad, J. I. (2016). Income inequality and foregone medical care in Europe during The Great Recession: multilevel analyses of EU-SILC surveys 2008–2013. *International journal for equity in health*, *15*(1), 101.

10. Fjær, E. L., Stornes, P., Borisova, L. V., McNamara, C. L., & Eikemo, T. A. (2017). Subjective perceptions of unmet need for health care in Europe among social groups: Findings from the European social survey (2014) special module on the social determinants of health. *The European Journal of Public Health*, *27*(suppl_1), 82-89.

[dataset] 11. ESS Round 7: European Social Survey Round 7 Data (2014). Data file edition 2.1. NSD - Norwegian Centre for Research Data, Norway – Data Archive and distributor of ESS data for ESS ERIC.

12. World Health Organization. (2000). *The world health report 2000: health systems: improving performance*. Geneva: World Health Organization.

13. World Health Organization. (2007). *Everybody's business: strengthening health systems to improve health outcomes: WHO's framework for action*. Geneva: World Health Organization.

14. Bataineh, H., Devlin, R.A. & Barham, V. (2018), Does unmet health care lead to poorer health outcomes?, Department of Economics, Faculty of Social Sciences, University of Ottawa, *Working Paper* N. 1803E.

15 Gibson, G., Grignon, M., Hurley, J., Wang, L. (2019). Here comes the SUN: Self-assessed unmet need, worsening health outcomes, and health care inequity. *Health Economics*, *28*(6), 727-735.

16. Röttger, J., Blümel, M., Köppen, J., Busse, R. (2016). Forgone care among chronically ill patients in Germany—Results from a cross-sectional survey with 15,565 individuals. *Health Policy*, *120*(2), 170-178.

17. Bataineh, H., Devlin, R. A., Barham, V. (2019). Unmet health care and health care utilization. *Health Economics*, *28*(4), 529-542.

18. Connolly, S., & Wren, M. A. (2017). Unmet healthcare needs in Ireland: Analysis using the EU-SILC survey. *Health Policy*, *121*(4), 434-441.

19. Lindström, C., Rosvall, M., & Lindström, M. (2018). Differences in unmet healthcare needs between public and private primary care providers: A population-based study. *Scandinavian journal of public health*, 1403494818762983.

20. Cylus, J., Papanicolas, I., & Smith, P. C. (2017). How to make sense of health system efficiency comparisons? Policy Brief 27, Copenhagen: WHO.

21. Dahlgren, G., & Whitehead, M. (1991). Policies and strategies to promote social equity in health. *Stockholm: Institute for future studies*.

22. Fitzgerald, R., & Jowell, R. (2010). Measurement equivalence in comparative surveys: The European Social Survey (ESS)—From design to implementation and beyond. *Survey methods in multinational, multiregional, and multicultural contexts*, 485-495.

23. ESS Methodology. (n.d.). Retrieved July 23, 2018, from http://www.europeansocialsurvey.org/methodology/ess_methodology/sampling.html

24. Eikemo, T. A., Bambra, C., Huijts, T., & Fitzgerald, R. (2017). The first pan-European sociological health inequalities survey of the general population: the European Social Survey rotating module on the social determinants of health. *European Sociological Review*, *33*(1), 137-153.

25. Beckfield, J., Balaj, M., McNamara, C. L., Huijts, T., Bambra, C., & Eikemo, T. A. (2017). The health of European populations: introduction to the special supplement on

the 2014 European Social Survey (ESS) rotating module on the social determinants of health. *European journal of public health*, *27*(suppl_1), 3-7.

26. Schokkaert, E., Steel, J., & Van de Voorde, C. (2017). Out-of-Pocket Payments and Subjective Unmet Need of Healthcare. *Applied health economics and health policy*, *15*(5), 545-555.

27. OECD/EU. (2016). Health at a Glance: Europe 2016: State of Health in the EU Cycle.

28. McGuire, A., & Costa-i-Font, J. (Eds.). (2012). *The LSE companion to health policy*. Edward Elgar Publishing.

29. Detollenaere, J., Hanssens, L., Vyncke, V., De Maeseneer, J., & Willems, S. (2017). Do we reap what we sow? Exploring the association between the strength of European primary healthcare systems and inequity in unmet need. *PloS one*, *12*(1), e0169274.

30. Yardim, M. S., & Uner, S. (2018). Equity in access to care in the era of health system reforms in Turkey. *Health Policy*, *122*(6), 645-651.

31. Aboneh, E. A., & Chui, M. A. (2017). Care coordination, medical complexity, and unmet need for prescription medications among children with special health care needs. *Research in Social and Administrative Pharmacy*, *13*(3), 524-529.

32. Reichard, A., Stransky, M., Phillips, K., McClain, M., & Drum, C. (2017). Prevalence and reasons for delaying and foregoing necessary care by the presence and type of disability among working-age adults. *Disability and health journal*, *10*(1), 39-47.

33. Sok, P., Gardner, S., Bekele, T., Globerman, J., Seeman, M. V., Greene, S., ... & Hwang, S. W. (2018). Unmet basic needs negatively affect health-related quality of life in people aging with HIV: results from the Positive Spaces, Healthy Places study. *BMC public health*, *18*(1), 644.

34. Reeves, A., McKee, M., Mackenbach, J., Whitehead, M., & Stuckler, D. (2016). Public pensions and unmet medical need among older people: cross-national analysis of 16 European countries, 2004–2010. *J Epidemiol Community Health*, jech-2015.

35. Quintal, C., Lourenço, Ó., Ramos, L. M., & Antunes, M. (2019) No unmet needs without needs! Assessing the role of social capital using data from European Social Survey 2014. *Health Policy*, *123*(8), 747-755.

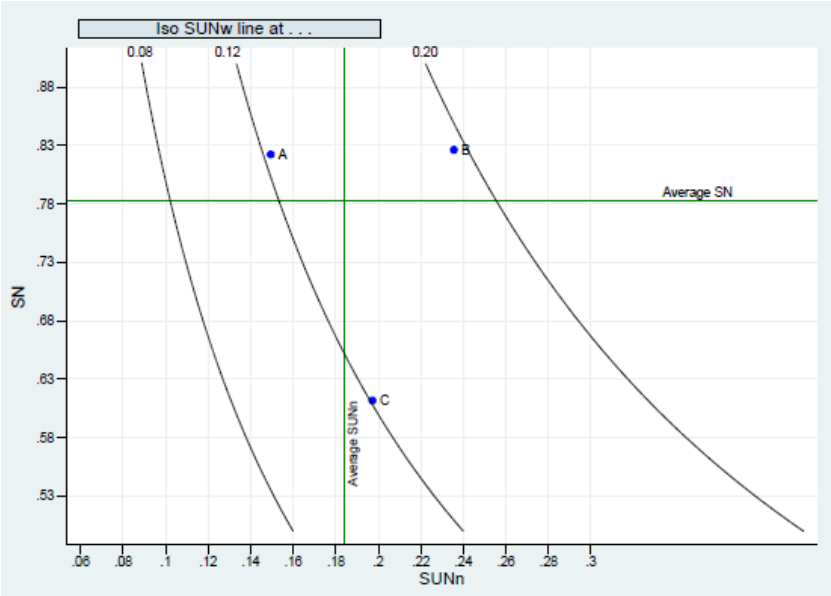
36. Richards, H. M., Reid, M. E., & Watt, G. C. M. (2002). Socioeconomic variations in responses to chest pain: qualitative study. *Bmj*, *324*(7349), 1308.

37. Wiltshire, J. C., Person, S. D., Kiefe, C. I., & Allison, J. J. (2009). Disentangling the influence of socioeconomic status on differences between African American and white women in unmet medical needs. *American journal of public health*, *99*(9), 1659-1665.

38. Bień, B., McKee, K. J., Döhner, H., Triantafillou, J., Lamura, G., Doroszkiewicz, H., ... & Kofahl, C. (2013). Disabled older people's use of health and social care services and their unmet care needs in six European countries. *The European Journal of Public Health*, *23*(6), 1032-1038.

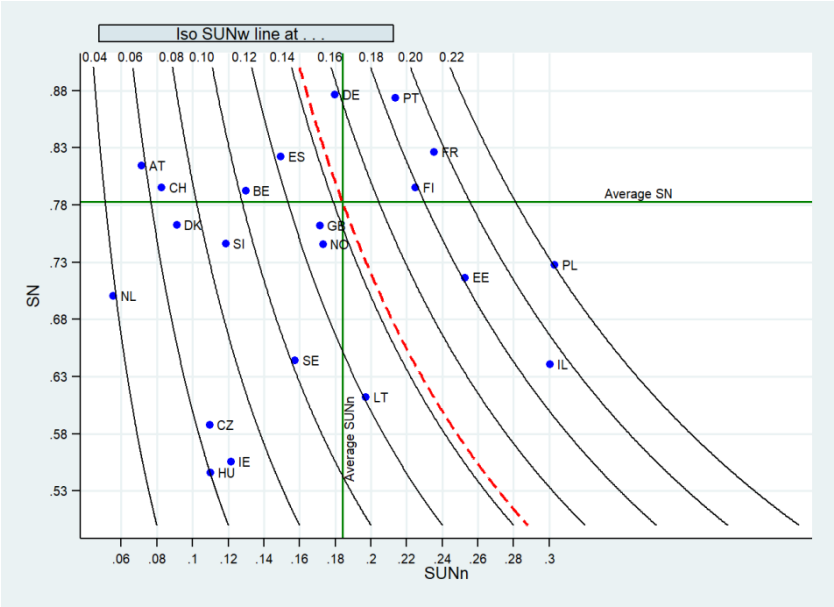
39. Klazinga, N. S., & Fujisawa, R. (2017). Measuring patient experiences (PREMS): Progress made by the OECD and its member countries between 2006 and 2016. *OECD Health Working Papers*, (102), 0_1-59.

Figure 1 – Illustrative representation of unmet needs and prevalence of need measures



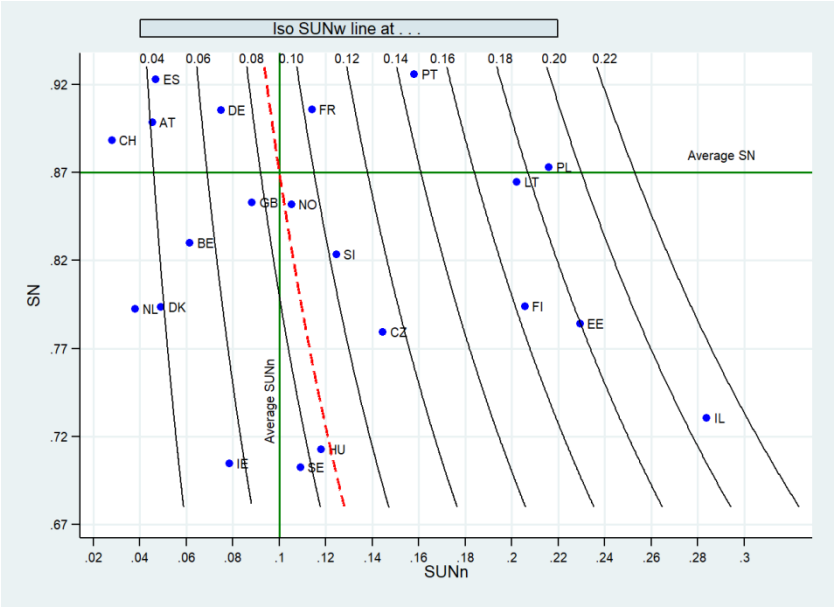
Note: SUN_w – prevalence of unmet needs among the population; SN – prevalence of needs; SUN_n – prevalence of unmet needs among those in need.
Each $isoSUN_w$ line is the set of all combinations of SUN_n and SN that produce a fixed value of SUN_w. The farther the $isoSUN_w$ line is from the origin, the higher its underlying level of SUN_w will be.

Figure 2 – Subjective unmet needs across Europe - population aged 15 or over



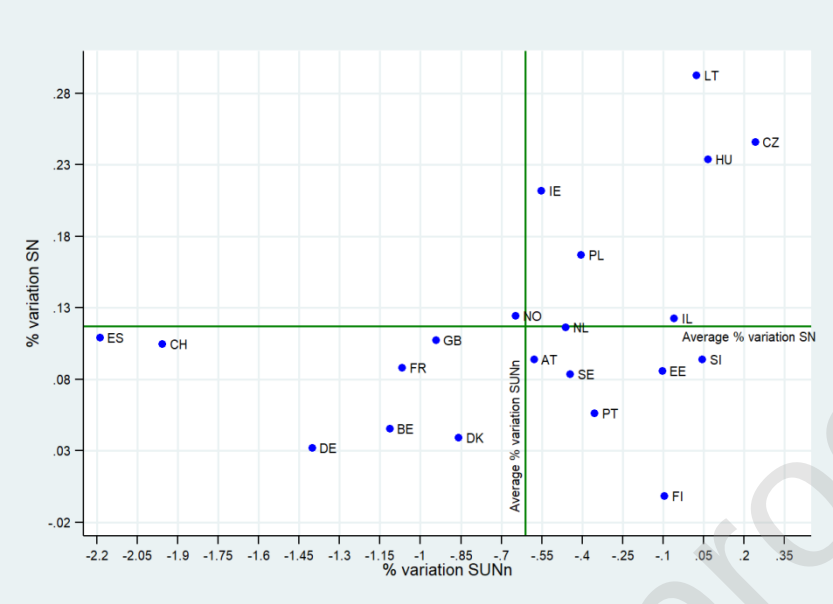
Note: SUN_w – prevalence of unmet needs among the population; SN – prevalence of needs; SUN_n – prevalence of unmet needs among those in need.
Each $isoSUN_w$ line is the set of all combinations of SUN_n and SN that produce a fixed value of SUN_w. The farther the $isoSUN_w$ line is from the origin, the higher its underlying level of SUN_w.will be.
Built using ESS (2014) data.

Figure 3 – Subjective unmet needs across Europe – population aged 65 years or over



Note: SUN_w – prevalence of unmet needs among the population; SN – prevalence of needs; SUN_n – prevalence of unmet needs among those exposed to need.
Each $isoSUN_w$ line is the set of all combinations of SUN_n and SN that produce a fixed value of SUN_w. The farther the $isoSUN_w$ line is from the origin, the higher its underlying level of SUN_w will be.
Built using ESS (2014) data.

Figure 4 –Differences in prevalence measures in population aged 65 years or over and the population aged 15 years or over



Note: % variation SN – percentage difference in the prevalence of needs between the population aged 65 years or over and the population15 years or over; % variation SUN_n – percentage difference in the prevalence of unmet needs among those exposed to need between the population aged 65 years or over and the population 15 years or over.
Built using ESS (2014) data.