A crisis like no other? Unmet needs in healthcare during the first wave of the COVID-19 crisis in Austria

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Background: Many patients experienced restricted access to healthcare during the Coronavirus Disease 2019 (COVID-19) pandemic. This study is among the first to provide systematic evidence on the existence of subjective unmet needs (SUN) in different population groups during the pandemic. **Methods:** Using data on individuals aged 20–64 and living in Austria from the AKCOVID survey (June 2020) and the 'European Social Survey' (2015), SUN were compared between 2015 and 2020, either related to the pandemic (fear of infection, provider closed or treatment postponed) or not (barriers related to knowledge, affordability, time and reachability). Multinomial logistic regression models identified determinants of SUN during the pandemic, adjusting for socio-demographics, socio-economic status and self-reported health. **Results:** Shares of the population with SUN in 2020 substantially exceeded SUN in 2015. Excess unmet needs were mostly attributable to the pandemic. Postponed treatments and closed providers were the most important reasons for SUN in June 2020. Older age groups (50–64 years), inactive and retired people were most likely to report pandemic-related SUN. We did not find socio-economic differences in pandemic-related SUN. **Conclusions:** The pandemic resulted in a supply-side shock to healthcare, with vulnerabilities emerging especially among older people, people with poor health and/or people no longer active on the labour market. Further research could focus on health system resilience and the possibilities to improve management of healthcare services during pandemics without widening inequalities while maintaining population health.

Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic had an unprecedented impact on European healthcare systems,[1] many of which experienced a shock at the pandemic's onset. Non-urgent treatments were postponed as health systems came under strain, and resources were dedicated or reserved for the treatment of COVID-19 patients instead. People with regular healthcare needs thus experienced a de-prioritization of essential healthcare services both in inpatient[2–4] and ambulatory care settings.[5,6] For example, in France during the first lockdown between March and mid-April 2020, visits to general practitioners (GPs) dropped by 40% and by 50% for physicians.[7] In Belgium, non-urgent interventions in hospitals dropped by 41% in April 2020 compared to April 2019.[8] Austria saw a drop in inpatient stays by 27% for myocardial infarction and by 80% for endoprothetic hip and knee surgeries in April 2020 compared to April 2019.[9] The largest decrease was seen for stays with myocardial infarction in April 2020, with a reduction of about 27% compared to April 2019. Of the available data for Austria, in 2020, there were 6.55 million fewer medical consultations, 135 000 fewer preventative medical check-ups, and 3.8 million fewer outpatient visits in funded hospitals compared to the previous year.[10] Consultations with general practitioners had decreased by 28% in April 2020 alone compared to April 2019, and by 17.5% in May compared to the previous year.[10]

There is still a dearth of knowledge about how this supply-side shock to health services has affected access to care across different population groups. Given the sudden nature of the pandemic, many countries' health systems were void of the preparation periods required to design equitable policy responses. Access to healthcare became suddenly restricted due to the focus on COVID-19 patients, while non-COVID-19 cases (e.g. chronically ill) were deprioritized or found practices and services closed, both among public and private healthcare providers. This may have led to an increase in subjective unmet needs (SUN) among those most in need of healthcare (i.e. those in poor health).

The COVID-19 pandemic bears some resemblance to previous crises, such as the Great Recession in 2008/09 when increased unemployment and reduced income were intertwined with increases in out-of-pocket (OOP) payments and reduced availability of some services, resulting in reduced affordability of healthcare and increased SUN for health care (i.e. self-assessed differences between care perceived as necessary by individuals and the care actually used). However, whereas previously supply-side effects were tied to intentional austerity (e.g. cuts in services or/and increased OOP), during the COVID-19 pandemic the supply of healthcare by public, private and complementary healthcare providers dropped due to the closure of ambulatory care practices, reductions in hospital admissions and a shift of resources to COVID-19 patients. The COVID-19 pandemic caused a very sudden shock to healthcare systems, bearing strong, sudden and relatively indiscriminate supply-side effects. Beyond the health sector, the pandemic has had a tremendous social impact.[11,12] Many private households in Austria saw their income drop in the context of crises-related work hour reductions and job loss.[13]

SUN are defined as individuals' subjective assessments that they have not received the care they needed,[14] as opposed to clinical

assessments.[15] Classic measures of SUN have been shown to have external validity as predictors of deteriorations in health status[16] and of health-related quality of life,[17] thus capturing actual access barriers with serious potential to affect health. SUN have been widely used to monitor barriers to accessing healthcare[18] and whether that access is 'systematically related to socioeconomic or other personal characteristics' ([14], p. 466). Previous studies have analysed factors related to SUN at the system-level (e.g. availability, waiting times) and the individual-level (e.g. fear of contagion) as well as associations of SUN with individual-level characteristics, in particular employment status, age and financial situation ([19,20]) as well as self-rated health.[21] In this study, we follow a similar approach and disaggregate between different factors associated with SUN.

Our analysis focuses on the first wave of the pandemic in Austria. Austria implemented relatively stringent virus containment measures at the onset of the pandemic,[22] but loosened measures more quickly than others. The country's first lockdown extended to shops, restaurants, schools and kindergartens. Yet, unlike in other European countries, no official guidelines were issued regarding the closure of ambulatory care practices and shifting of services in hospitals, resulting in overly restrictive access to inpatient care during the first wave and large variation across ambulatory care providers.[6,23] Administrative data on inpatient treatments show substantial reductions in hospital admissions and indications for delayed care-seeking.[9,10] Austria has a social health insurance system and generous levels of public health expenditure, in which the prevalence of SUN has traditionally been low compared to other countries despite comparatively high OOP expenditures, and an increasing share of private ambulatory care providers.[24]

We hypothesize that supply-side restrictions led to an increase in SUN in Austria during the pandemic. The sudden restrictions in the 'availability' of healthcare likely had the greatest impact on the SUN of those with poorer health and greater need for healthcare. Among the population who had a need for healthcare during the observation period, 'affordability'—and thus income and employment status—may have played a lesser role in the risk of SUN compared to previous crises, in line with our above argument on the singular nature of this crisis. Following Andersen's Behavioural model,[25] we group patients' characteristics into predisposing factors (gender, age), needs factors (self-rated health) and enabling factors (education, employment, income). Further, we distinguish demand- and supply-side factors in our analysis.[26,27]

Methods

Data

Unmet healthcare needs during the pandemic are captured by a representative survey of 2000 respondents aged 20–64, carried out in Austria between 18 June and 2 July 2020 (AKCOVID-Survey).[13,28] Respondents either took part in an online survey (CAWI) (80%) or were interviewed by telephone (CATI) (20%). A quota sample based on gender, age, education, household composition and regions was used. To reduce potential sampling- and non-response bias, post-stratification weights were constructed based on these same variables. As a baseline for pre-pandemic unmet needs, we use wave 7 (2015) of the European Social Survey (ESS). The ESS uses strict random sampling and collects data face-to-face. Despite differences in sampling strategy and data collection methods, previous studies have attested to the validity of comparing quota sampling with the probabilistic sampling of ESS (cf. Ref. ([29])) and have used the ESS as a baseline for comparisons with the AKCOVID.[30] A table including descriptive statistics from both data sets is included in the Supplementary materials.

Dependent variable: SUN and reasons for it

SUN is operationalized as forgone medical examination or treatment (including doctor's visits, therapies and operations) since the beginning of the pandemic (three months reference period) that was perceived as needed. The AKCOVID survey data allow us to distinguish those that had needs and managed to access care during the pandemic from those without care needs, two groups frequently indiscernible in the SUN literature. Conditional on reporting SUN, respondents provided the reason for it, which we categorized into pandemic-related SUN and SUN unrelated or not directly attributable to the pandemic (in short: regular SUN). The dependent variable thus has four categories: had a need and received care ('need met'), 'pandemic-related SUN' (fear of infection, provider closed, treatment postponed), 'regular SUN' (financial barriers, knowledge, waiting times, reachability, time) and 'no need' since the pandemic's onset. SUN in ESS are operationalized as a binary variable and directly correspond with the category of regular SUN in the AKCOVID data (see Supplementary table S1 for wording of questions and responses).

Covariates

Employment status is categorized into employed (full- or part-time, furloughed, self-employed, farmer or on temporary leave), unemployed, inactive (in education, unable to work, housework or providing childcare) and retired. The household income situation is dichotomized as 0 if the household members feel they could make ends meet or lived comfortably and 1 when they found it difficult to manage on the current income (indicator of subjective financial well-being). Self-reported health (SRH) is operationalized as 0 if the respondents reported their health as poor or very poor, and as 1 otherwise.

Analytical approach

We first identify excess subjective unmet need due to the pandemic by comparing levels of SUN in June 2020 across age, self-rated health and various socio-economic status (SES) groups to a pre-pandemic baseline. Secondly, we apply multinomial logistic regression to identify the determinants of SUN in June 2020, controlling for gender, age group, education, employment, financial well-being and self-rated health (model 1), and subsequently restricting the sample to those who reported having needs (model 2). All multivariate results are reported as predicted probabilities.

Results

Comparison of SUN in 2015 and 2020

After the onset of the COVID-19 pandemic, 20% of the Austrian population aged 20–64 reported SUN for healthcare, a statistically significant increase from the 5.9% that reported SUN in 2015 (column a in table 1). SUN for reasons not directly related to the pandemic (column c) were reported by only 4% of the population in June 2020. In both surveys, regular SUN included SUN due to financial barriers, which thus appear not to have increased due to the pandemic. Nearly all the additional SUN observed in June 2020 ('excess SUN' in table 1) referred to reasons attributable to the COVID-19 pandemic.

The increase in SUN in June 2020 was, however, highly heterogeneous. Those employed, retired, inactive, with difficulties making ends meet, aged 50 years or older or in poor SRH reported the highest total SUN in June 2020 (column b in table 1). For most groups, the prevalence of regular SUN (column c) was not statistically different from total SUN reported in 2015. The exceptions were 40–49 years-olds, those with secondary education, those without difficulties making ends meet and those with good SRH, for whom prevalence of regular SUN was actually lower in June 2020

(significant at $P < 0.05$). For pensioners, the prevalence of regular SUN in 2020 was higher than total SUN in 2015, but this difference was not statistically significant. For all the groups depicted in table 1, the increase in SUN reported in 2020 was due to pandemic-related reasons. This excess SUN was particularly high among retirees, those with poor SRH, inactive, aged 50–64 or with difficulties making ends meet. It is worth bearing in mind the overlapping characteristics between poor SRH and all of these characteristics (correlation analysis available in Supplementary material).

Prevalence of SUN

Among the reasons for SUN (table 2), the most important ones were related to the pandemic. About 7.3% of the entire sample reported postponed treatment or examination as the reason for SUN, followed by closed practice or clinic (7.0%), while fear of infection was mentioned much less often (1.8%). Almost one-fifth of retired people (18.7%) indicated having experienced postponements, followed by 14.1% of people with poor SRH and 11.6% of 50–64-year-olds. Closed providers were reported most often by people with poor

Table 1 SUN in 2015 and 2020, by selected groups and type of SUN

	Total SUN 2015 (a)	Total SUN 2020 (b)		regular SUN 2020 (c)		Excess SUN (b)–(c) *P.P.*
	%	%	*P*-value (b)–(a)	%	*P*-value (c)–(a)	
Total	5.9	20.1	<0.001	4.0	0.03	16.1
Age groups						
20–39 years	5.8	17.5	<0.001	5.2	0.67	12.3
40–49 years	6.4	15.2	0.001	1.9	0.001	13.3
50–64 years	5.7	26.4	<0.001	3.9	0.20	22.5
Education						
Primary	4.9	20.7	<0.001	7.1	0.41	13.6
Secondary	6.2	21.6	<0.001	3.7	0.01	17.9
Tertiary	6.1	17.0	<0.001	3.3	0.06	13.7
Self-rated health						
Poor	12.0	37.3	<0.001	8.6	0.20	28.7
Good	4.7	13.4	<0.001	2.2	0.003	11.2
Employment status						
Employed	4.7	16.7	<0.001	3.5	0.18	13.2
Unemployed	11.5	25.7	0.04	7.7	0.44	18.0
Retired	3.9	36.6	<0.001	4.4	0.86	32.2
Inactive	8.6	28.5	<0.001	4.5	0.15	24.0
Income situation						
Comfortable/managing	5.1	18.0	<0.001	3.0	0.02	15.0
Difficult	10.7	27.7	<0.001	7.6	0.23	20.1
Sample size (N)	1345	1970				

Note: Weighted values. *P*-values for comparison with SUN in 2015, using *F*-test. All results unadjusted.

Table 2 Descriptive statistics of types of SUN reported, row percentages

	No need	Need met	Excess SUN: fear of infection	Excess SUN: closed provider	Excess SUN: treatment postponed	Regular SUN: financial barriers	No. of observations
Total	56.4	23.5	1.8	7	7.3	0.6	1970
Gender							
Men	60.0	21.5	1.7	5.9	6.8	0.2	982
Women	52.4	25.8	1.8	8.3	7.8	1	988
Age							
20–39 years	57.0	25.5	2.1	5.8	4.4	0.4	821
40–49 years	62.6	22.2	0.9	6.3	6.2	0.1	479
50–64 years	51.6	22.1	1.9	8.9	11.6	1.1	670
Education							
Primary	58.7	20.6	2.4	4.5	6.7	0.9	121
Secondary	56.8	21.7	1.6	7.7	8.7	0.8	1319
Tertiary	54.6	28.4	1.9	6.8	5	0.1	530
Self-rated health							
Poor	34.5	28.2	4.1	10.5	14.1	1.5	539
Good	64.8	21.8	0.9	5.7	4.7	0.2	1431
Employment status[a]							
Employed	60.2	23.0	1.4	6.2	5.8	0.4	1520
Unemployed	46.7	27.3	0.4	9.9	7.9	3.6	156
Retired	39.8	23.6	4.3	9.2	18.7	0	148
Inactive	48.2	24.2	4.3	9.2	9.5	0	146
Income situation[a]							
Difficult	47.3	25.0	3.4	9.2	7.6	1	441
Not difficult	58.9	23.2	1.3	6.4	7.3	0.5	1529

Source: AKCOVID wave 1. Weighted results.
a: At the time of the survey.
Note on graphical display: darker areas are subgroups with a higher share of SUN among those with SUN.

SRH (10.5%) and the unemployed (9.9%). By contrast, financial barriers played a marginal role (0.6%). The unemployed (3.6%), people with poor SRH (1.5%), and those aged 50–64 years (1.1%) most often reported financial-related barriers, while inactive and retired people did not report any financial barriers as the main reason for SUN. Fear of infection was comparatively highest among people with financial difficulties and inactive and retired people (table 2).

Multivariate analysis

When controlling for individual characteristics, difficulties in making ends meet and SRH status (figure 1, upper panel, model 1), people in the oldest age group (50–64 years) continue to be significantly more likely to report pandemic-related SUN compared to younger age groups. The same is true for inactive and retired people, who are on average nine to ten percentage points more likely to report pandemic-related SUN compared to the employed. In addition, women reported higher pandemic-related SUN (compared to men). Regular SUN were significantly higher among people with lower financial wellbeing, and in the youngest age group (20–39 years) compared to the middle-aged group. For both types of SUN, people with poor SRH are statistically significantly more likely to report SUN.

When restricting the sample to those with needs for healthcare (figure 1, lower panel, model 2), older age and being outside the labour market (i.e. inactive or retired) were more strongly associated with pandemic-related SUN compared to the non-restricted model, while we no longer find any significant differences by financial wellbeing and gender. As for the determinants of regular SUN, the age effect and the effect of financial wellbeing become statistically non-significant, while people with poor SRH are eight percentage points more likely to report regular SUN than people with good SRH.

Finally, there is an additive effect of poor SRH and older age on experiencing pandemic-related SUN (figure 2, left panel), highlighting that each factor independently increases the probability of experiencing pandemic-related SUN. The same effect is not observed for financial difficulties (figure 2, right panel).
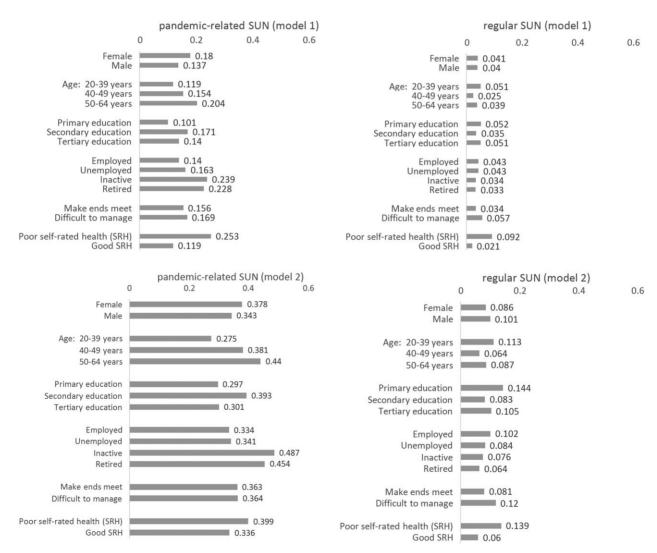

Figure 1 Predicted probabilities based on multinomial logistic regressions according to Model 1 (including 'no needs' category) (upper panel) and Model 2 (excluding 'no needs' category) (lower panel)

Reading example: women have a significantly higher probability than men to report pandemic-related SUN. Their probability is 4.3 percentage points higher (i.e. the difference between the predicted probability for men, and the predicted probability for women).

Note: See Supplementary materials online for further detailed calculations of average marginal effects.

*P ≤ 0.05; **P ≤ 0.01; ***P ≤ 0.001.

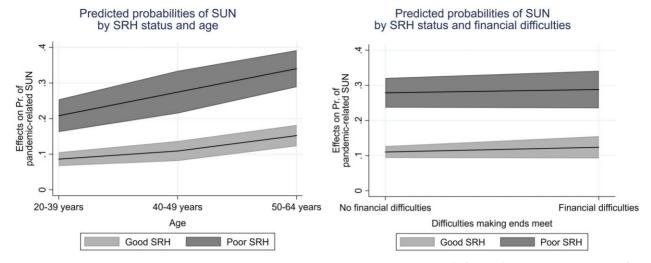SRH, self-rated health; SUN, subjective unmet needs.

Figure 2 Predicted probabilities to report SUN related to the pandemic by SRH status and age (left panel), and by SRH status and financial well-being (right panel)

SRH, self-rated health.

Discussion

We used survey data collected during the first wave of the COVID-19 pandemic in Austria framed by Andersen's Behavioural Model of Healthcare,[25] to investigate whether the sudden shock, primarily due to supply-side restrictions in healthcare services,[26] led to an increase in SUN in Austria among the working age population, and if so, which groups were particularly affected. We hypothesized that—unlike in previous (economic) crises in Europe—restrictions in access had a greater impact on the SUN of those with poor health and thus greater need for healthcare. Affordability was expected to play a lesser role in driving SUN due to the nature of the pandemic and the policy responses enacted. We thus expected those groups that were found to be more vulnerable to SUN in previous crises such as the unemployed or those with lower income, to have experienced a limited increase in SUN in this crisis.

Our study has four key messages. Firstly, there was a stark increase in SUN in the pandemic ('excess SUN')—as levels of SUN rose from about 6% in 2015 to 20% in June 2020, the latter value being dramatically high for Austria, a country where SUN are traditionally low.[24] These 'excess SUN' or 'pandemic-related SUN' comprise three reasons: postponed treatments, closed providers and fear of infection, with the latter playing a marginal role in all groups. We thus confirm that the pandemic represented a supply-side shock for health services of unprecedented scale. The fact that SUN levels (at least) tripled, even if during a limited period of time,[9] deserves further analysis on the adequacy of some of the policy responses enacted during the pandemic and their impact on accessibility of care. While it is possible that some of this excess SUN might have been met afterwards, available figures on the number of procedures carried out in Austria in each month during 2021 do not seem to indicate that such catching-up occurred after the lockdown.[9,10]

Secondly, we did not find socio-economic differences in pandemic-related SUN at the beginning of the COVID-19 crisis, what in Andersen's model would have been described as 'enabling factors', irrespective of health status in our data. A study in the UK also found no income inequity for hospital outpatient and inpatient care in its national health system,[31] while pro-rich inequities in access to GP consultations, prescriptions and medical helplines observed at the peak of the first wave were eliminated as the pandemic progressed. A cross-European study in the older population, i.e. among people aged 50 years and older, found evidence of economic vulnerability contributing to higher SUN, albeit with strong variation across countries and heterogeneity depending on the type of SUN analysed. Our study, by contrast, suggests that the COVID-19 crisis may have been different from previous crises. Previous crises were triggered by economic shocks in which mounting public deficits were met with severe cuts in public budgets for healthcare, such as reduced statutory access[32] or increased OOP payments,[31,32] which lead to a sharp reduction in access to healthcare, particularly for lower income groups.[33–36] As Madureira-Lima et al.[37] show, income inequalities in unmet need during such previous crises were strongly modified by employment status, especially as job loss meant diminishing financial resources or lack of statutory healthcare coverage.

In the current pandemic, the shock may have been too sudden and the mechanisms restricting access to care too extensive for socio-economic differences to take effect: with many clinics and providers restricting access for non-COVID patients, those with higher socio-economic status may have been unable to find the care they needed even if they could pay for it. As hypothesized, financial barriers were not as relevant in the pandemic compared to pre-crisis times, likely due to the fact that the pandemic resulted in a supply-side shock to healthcare services, with no immediate increases in OOP implemented at the onset at the pandemic. Our results provide credence to the relevance of distinguishing between supply and demand side factors in assessing care use in the context of this pandemic, in line with Levesque et al.[26] theoretical model of access to healthcare.

Thirdly, people in poor health (measured by SRH status) were consistently more likely to report excess SUN in the pandemic. The inactive or retired also faced higher pandemic-related SUN. This is in contrast to previous crises as mentioned above, where instead unemployment and financial well-being were stronger determinants of SUN.[37] Even though we cannot fully rule out that other factors such as language barriers or being able to take time off work continued to impede demand, our findings suggest that a supply-side shock as seen at the onset of the pandemic may have created different vulnerabilities for unmet needs than in previous crises.

Fourthly, older people aged 50–64 were particularly affected by unmet needs in the pandemic. Being in worse health in the oldest age group compounded excess SUN via an additive effect. Two potential mechanisms may explain this: On the one hand, access to healthcare services was restricted in general as providers (especially in hospitals) reserved capacities for COVID-19 patients. On the other hand, restricted access was primarily intended to eliminate potential stays in intensive care units (ICUs). Thus, it is reasonable to assume that older people or people with co-morbidities were affected more often by postponements, e.g. of elective surgeries. Patients with a higher risk of requiring ICU care after regular surgeries (e.g. hip replacements) may thus have been—consciously or subconsciously—de-

prioritized even further, especially as no national guidelines existed for hospitals on which patients (not) to treat in Austria.

This study has some limitations. It could not differentiate between types of services forgone (e.g. inpatient services, specialist care), which may showcase different inequalities in SUN, as seen in the UK.[31] In addition, as our SUN variable is binary, we were unable to determine the frequency of attempts to access healthcare (i.e. in line with standard measures of SUN in the literature, we did not count the number of SUN events during the reference period). Moreover, while similar, the questions on SUN in AKCOVID and the 2015 ESS slightly differ in their formulation, however, we are confident that the questions are still comparable. It is likely that the shorter timeframe for unmet needs of the AKCOVID survey (3 months) under-reported needs compared to the ESS (12 months, i.e. longer timeframe), therefore underestimating changes in SUN since 2015. In addition, it is plausible that some regular SUN became less relevant during the pandemic (e.g. lack of time, layoff and raising unemployment or long waiting list), impacting the proportion of respondents reporting non-pandemic-related SUN, however reduced sample sizes preclude testing this via further disaggregation of regular SUN. Furthermore, our study only covers the early stages of the pandemic; groups experiencing SUN may have become more diverse the longer the pandemic persisted.

Conclusions

Our study provides insights into the effects of the COVID-19 pandemic in Austria. Its findings highlight some policy implications relevant also for other European countries. In particular, the lack of escalation and preparedness plans for hospitals and ambulatory care providers may have increased gaps in accessibility for non-COVID-19 patients during the pandemic.[23] Prior to the pandemic, more than 1.5 million Europeans declared unmet needs for healthcare,[33] a figure that is bound to have increased significantly as healthcare systems prioritized assistance to COVID-19 patients. Efforts to improve health system resilience will be required to protect groups particularly vulnerable to SUN during crisis times. Also, had the role of primary care providers been strengthened in Austria early on in the pandemic, as in other countries, e.g. the Netherlands and Slovenia, vulnerable groups such as patients with chronic conditions could have been encouraged to continue using standard health services.[23,38] Our data show a dramatic and primarily supply-driven increase in SUN, bearing the risk of increased costs in the future, both financially for the public health system and regarding patients' health. With the economic situation worsening, especially for people in socially disadvantaged groups, these features of the Austrian healthcare system may render health services unaffordable for many. Dramatic changes in household income that were observed in Austria early on in the pandemic may call for a focus on (financially) vulnerable groups also in the mid to long term.[13]

Beyond the health sector, the pandemic has had a tremendous social impact, through the widespread closure of economic sectors, rising unemployment and reduced incomes. The most vulnerable economically and socially are also at greater risk of non-communicable diseases and poor self-rated health, compounding existing patterns of inequalities in European societies.[12,39] Yet, the social determinants of health have received little attention in the ways governments are tackling the pandemic thus far. More research will be needed in the future to observe the mid to long-term impact on socially vulnerable groups regarding the existence of SUN, especially when deepening pre-existing inequalities.[40]

Supplementary data

Supplementary data are available at *EURPUB* online.

Key points

- There was a stark increase in subjective unmet needs (SUN) for healthcare in the pandemic ('excess SUN') during and after the first wave of the pandemic in Austria.
- Poor health, older age and exclusion from the labour market increased levels of pandemic-related SUN among people of working age.
- We do not find differences in pandemic-related SUN by individuals' financial situation at the beginning of the COVID-19 crisis.
- Vulnerabilities in the pandemic differ from previous crisis patterns.
- Efforts to step up health system resilience will be required to protect groups particularly vulnerable to SUN during crisis times.

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