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BMJ Open Systematic review of individual-level, community-level, and healthcare system-level factors contributing to socioeconomic differences in healthcare utilisation in OECD countries with universal health coverage

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ABSTRACT

Objectives Countries with universal health coverage (UHC) strive for equal access for equal needs without users getting into financial distress. However, differences in healthcare utilisation (HCU) between socioeconomic groups have been reported in countries with UHC. This systematic review provides an overview individual-level, community-level, and system-level factors contributing to socioeconomic status-related differences in HCU (SES differences in HCU).

Design Systematic review following the Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA) guidelines. The review protocol was published in advance.

Data sources Embase, PubMed, Web of Science, Scopus, Econlit, and PsycInfo were searched on 9 March 2021 and 9 November 2022.

Eligibility criteria Studies that quantified the contribution of one or more factors to SES difference in HCU in OECD countries with UHC.

Data extraction and synthesis Studies were screened for eligibility by two independent reviewers. Data were extracted using a predeveloped data-extraction form. Risk of bias (ROB) was assessed using a tailored version of Hoy's ROB-tool. Findings were categorised according to level and a framework describing the pathway of HCU.

Results Of the 7172 articles screened, 314 were included in the review. 64% of the studies adjusted for differences in health needs between socioeconomic groups. The contribution of sex (53%), age (48%), financial situation (25%), and education (22%) to SES differences in HCU were studied most frequently. For most factors, mixed results were found regarding the direction of the contribution to SES differences in HCU.

Conclusions SES differences in HCU extensively correlated to factors besides health needs, suggesting that equal access for equal needs is not consistently accomplished. The contribution of factors seemed highly context dependent as no unequivocal patterns were found of how they contributed to SES differences in HCU. Most studies examined the contribution of individual-level

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This systematic review followed a prepublished and peer-reviewed study protocol enhancing transparency and consistency.
- ⇒ A comprehensive and extensive overview of the widespread and heterogeneous research on socioeconomic differences in healthcare utilisation is provided, including multiple study designs, populations, types of healthcare, socioeconomic indicators, and studies with socioeconomic differences as by-product rather than main focus.
- ⇒ Categorisation according to individual-level, community-level, and system-level and a framework describing the pathway of healthcare utilisation provided valuable insights into the frequently examined factors and research gaps.
- ⇒ An all-encompassing coverage could not be guaranteed because a 10% random sample of backward-snowballing and forward-snowballing results was screened.

factors to SES differences in HCU, leaving the influence of healthcare system-level characteristics relatively unexplored.

INTRODUCTION

One of the important objectives of healthcare systems in countries with universal health coverage (UHC) is to provide necessary care for all individuals who need it, devoid of significant financial consequences.¹ This is referred to as 'equal access for equal needs'. The process of actually receiving (appropriate) care is described by Levesque *et al*² in a theoretical framework. This framework describes in six steps the pathway between healthcare needs and consequences of care use (*figure 1*): given a healthcare need, one

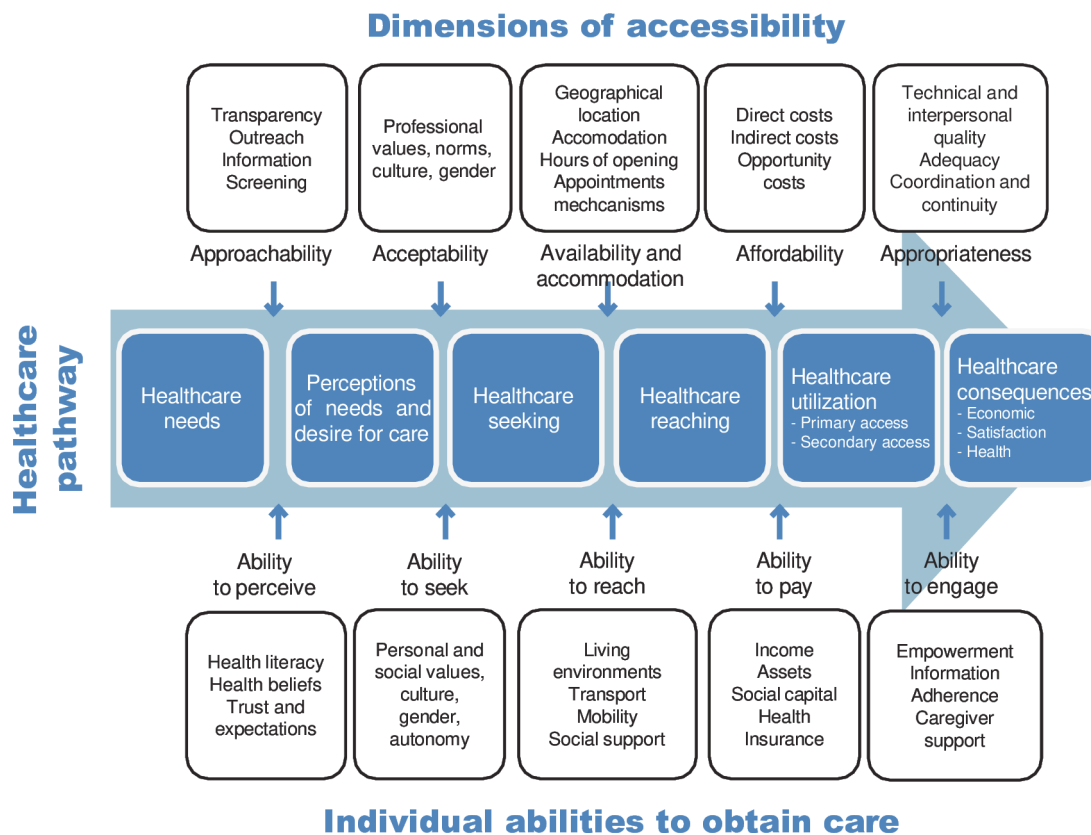


Figure 1 Conceptual framework of healthcare utilisation (adapted from Levesque *et al*²).

should first have the opportunity to perceive the need and desire for care and thereafter seek, reach, and actually use healthcare. Finally, the consequences of healthcare use can differ per patient and treatment. Factors along the healthcare pathway may impact the equal access for equal need principle. These factors consist of five dimensions of accessibility (approachability, acceptability, availability and accommodation, affordability, and appropriateness) and five abilities required to obtain access to care (ability to perceive, ability to seek, ability to reach, ability to pay, and ability to engage).

A large body of literature have indicated that healthcare utilisation (HCU) differs by socioeconomic status (SES).^{3–5} Following Levesque’s framework, differences in HCU between socioeconomic groups may arise due to differences in healthcare needs (starting point of Levesque’s framework), differences in dimensions of accessibility or differences in individual abilities to obtain access to care. Extensive scholarly work showed that lower socioeconomic groups tend to have poorer (mental) health status,^{6–8} a key indicator of healthcare needs. According to the principle of ‘equal care for equal need’, variation in HCU between socioeconomic groups that are primarily attributed to differences in healthcare needs could generally be considered as justifiable or acceptable variance in HCU. On the other hand, variation attributed to differences in dimensions of accessibility and abilities to obtain healthcare could be considered unjustifiable or unacceptable. A socioeconomic component may emerge

in each stage of the healthcare pathway given a present healthcare need.^{9–11} For example, low health literacy among lower socioeconomic groups,¹² poor accessibility of healthcare facilities by public transport on which people with lower SES merely depend,¹³ or different patient–doctor interaction.¹⁴

Factors determining HCU can, next to the classifications by Levesque *et al*,² be categorised in individual-level, community-level, and healthcare system level factors (ie, multilevel categorisation).¹⁵ In this division, individual-level factors refer to personal characteristics that may influence HCU, like sex, age, or educational attainment. On the community-level, local constraints in availability and access on the supply side such as regional variation in the distance to a healthcare provider, can impede HCU.^{2 16 17} Also, physical and social neighbourhood characteristics may influence the distribution of HCU on a community level, such as the degree of urbanisation.¹⁸ The organisational structure of care provision, resources, and financing such as UHC and deductibles can affect SES differences in HCU on a system-level. For example, capitation and skip-and-pay gatekeeping schemes may reduce more healthcare visits of lower than higher socioeconomic groups, implying larger socioeconomic differences,^{19 20} or income differences in the uptake of cancer screening which was mainly determined by the possession of private health insurance.²¹

Although a large body of literature has researched one or more factors that contribute to SES differences

in HCU, knowledge is fragmented. Importantly, determinants of SES differences in HCU were mostly used as control variables or by-products rather than the main variables of interest. By striving for equal access for equal needs, comprehensive knowledge regarding factors that contribute to SES differences in HCU may be particularly relevant for policymakers. Therefore, this review aimed to improve understanding of why utilisation patterns differ between socioeconomic groups. For comparability and relevance, we limited our scope to Organisation for Economic Co-operation and Development (OECD) countries with UHC and broad social benefit schemes. We formulated the following research questions:

1. Which factors have been examined in quantitative research for their contribution to differences in various types of HCU between socioeconomic group?
2. In which direction do these factors affect socioeconomic differences in HCU?

Here, 'affect' should be interpreted in a broad sense, as it includes terms such as interaction, moderation, modification, mediation, aggravation, correlation, and association.

METHODS

The systematic review followed the Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA) guidelines.^{22 23} The previously published review protocol was followed,²⁴ with one adaptation. We added an additional eligibility criteria which excluded COVID-19-related types of healthcare use or research questions because of incomparability between pandemic and non-pandemic situations. We included all articles that met the updated eligibility criteria outlined in [table 1](#). The list of eligible countries is presented in online supplemental material 1.

Search strategy

Embase, PubMed, Web of Science, Scopus, Econlit, and PsycInfo were searched. The search strategy for PubMed is presented in online supplemental material 2. Similar search strategies were used for the other databases. Using Boolean operators, we searched title and abstracts for all terms, synonyms, and thesaurus terms within a key concept. The search was performed on 9 March 2021. After the main search, four additional identification strategies were used: (1) all underlying studies of included systematic reviews were screened, (2) forward

Table 1 Eligibility criteria

	Inclusion criteria	Exclusion criteria
Outcome measure	<ul style="list-style-type: none"> ▶ Difference in HCU between socioeconomic groups ▶ Primary and specialised types of healthcare on individual level ▶ HCU is expressed as volume, cost/expenses, or access to care ▶ Utilisation is analysed with respect to socioeconomic group ▶ Socioeconomic status is expressed as broad measures of income, education, occupational status, a composite measure, or any other indicator used as a proxy for SES 	<ul style="list-style-type: none"> ▶ No measure of socioeconomic difference ▶ Preventive care, screening, or COVID-19-related care ▶ HCU is expressed as the quality of care or waiting times ▶ No breakdown by socioeconomic groups
Factors of interest	<ul style="list-style-type: none"> ▶ Study examines potential factors contributing to differences in HCU between socioeconomic groups 	<ul style="list-style-type: none"> ▶ Studies researching the effect of interventions on differences in HCU between socioeconomic groups
Population	<ul style="list-style-type: none"> ▶ Adult population: 18 years or older (foremost) ▶ OECD countries ▶ Countries with UHC 	<ul style="list-style-type: none"> ▶ Youth or adolescents: younger than 18 (foremost) ▶ Non-OECD countries ▶ Countries without UHC
Setting		<ul style="list-style-type: none"> ▶ COVID-19-related research questions
Language	<ul style="list-style-type: none"> ▶ Dutch ▶ English 	<ul style="list-style-type: none"> ▶ Other languages
Publication date		<ul style="list-style-type: none"> ▶ No restrictions on publication date
Study design	<ul style="list-style-type: none"> ▶ Quantitative study ▶ Reviews ▶ Mixed-method studies 	<ul style="list-style-type: none"> ▶ Qualitative study
Type of publication	<ul style="list-style-type: none"> ▶ Journal articles ▶ Eligible papers underlying reviews 	<ul style="list-style-type: none"> ▶ Grey literature ▶ Other non-peer-reviewed publications

HCU, healthcare utilisation; OECD, Organisation for Economic Co-operation and Development; SES, socioeconomic status; UHC, universal health coverage.

and backward snowballing procedure was conducted on all included studies from the main search, of which a random sample of 10% was screened to check the sensitivity and completeness, (3) the main search strategy was updated on 9 November 2022, and (4) all underlying studies of included systematic reviews from the search update were screened. The 10% sample of the studies obtained through backward and forward snowballing was drawn randomly using random assignment selection of record numbers in EndNote V.20²⁵ and Excel 2016 for Office 365.

Selection procedure

Results from all literature databases were combined and deduplicated using EndNote V.20.²⁵ The title and abstract, followed by full text, were screened for eligibility using Rayyan²⁶ by two independent reviewers (IM and NS, EU, SP, or TJ). Disagreements were solved by consulting a third researcher and/or an independent researcher (NS, EU, SP, or TJ). An inter-rater reliability score (kappa-statistic) was calculated to assess the consistency of judgement between researchers.

Data extraction procedure

A predeveloped extraction form was used for extracting data from all included studies. The data extraction form was tested on a random selection of 5% of the included studies by two researchers (IM and NS). Minor adjustments and refinements were made following the pilot. The final extraction form consisted of multiple items related to characteristics of the study population, study design, and outcomes (including the type of health service, SES measure, factor, baseline SES difference, the contribution of a factor on differences and significance) (online supplemental material 3). One author (IM) extracted the data from all included studies. Another author checked any salience of the extraction results and assisted in case of unclarity (NS or EU).

Synthesis of results

To answer the first research question, we graphically presented all factors that have been examined in quantitative research for their contribution to differences in HCU between socioeconomic groups. For comparison purposes, factors, types of HCU, and SES indicators were categorised into more general terms. We used the multilevel categorisation for the factors, complemented by the framework of Levesque *et al.*² to categorise and interpret the results. For SES indicators, the classification of higher and lower SES was adopted from the original study without prior restrictions of SES-group definitions. A heatmap presented the number of studies that analysed a specific combination of the types of health services and factors.

To answer the second research question, we identified the direction of contribution of factors to SES differences in HCU. For this quantitative analysis, we used a subset of studies that (1) were conducted on a general

population (ie, excluding studies on specific diseases or personal characteristics), (2) examined the contribution of factors in isolation, and (3) tested for significance of the contribution of the factor to SES differences in HCU. The papers were assessed on risk of bias (ROB), summarised numerically and visualised graphically. The contribution of these factors were split into three categories:

1. The factor did not contribute to SES differences in HCU
2. The factor contributed to higher healthcare use among lower-SES groups (and was statistically significant)
3. The factor contributed to higher healthcare use among higher-SES groups (and was statistically significant).

We counted the number of studies that examined a specific combination of SES indicator, factor, and direction of contribution. If a study used more than one SES indicator, but found a similar effect direction for each indicator, this study was counted once for each SES indicator. It should be emphasised that we focused on the contribution to SES differences in HCU, independently of the existing baseline SES differences.

Risk-of-bias assessment

Hoy's ROB tool²⁷ was tailored for the quality appraisal to fit with types of studies included in this review, as Hoy's ROB tool was developed for prevalence studies. The assessment consisted of 10 items covering selection bias, measurement and methodological bias, and reporting bias. The following items were assessed by two independent researchers (IM and TJ): representativeness of the national population, representativeness of the target population, risk of non-response bias, data collection method, appropriateness of shortest prevalence length, the process of handling missing data, presence of sensitivity analyses or robustness checks, the likelihood of outcome framing, and likelihood of conflicting interests. Each item was judged as 'low risk', 'high risk', or 'unclear'. The overall assessment on the ROB was rated as 'low risk', 'moderate risk', or 'high risk', which was based on the researcher's assessment of previous items. Disagreements were solved by mutual discussion or by consulting a third independent researcher (EU or NS). The elaboration and specified guidelines of the tailored ROB assessment tool is presented in the online supplemental material 4, table 1.

Sensitivity analysis

A sensitivity analysis was conducted to assess some potential dependencies of the results. The findings on the direction of contribution of factors to SES differences in HCU were stratified by (1) baseline SES difference, (2) whether or not studies accounted for healthcare needs, or (3) overall ROB score.

Patient and public involvement

Patients and the public were not involved in this research.

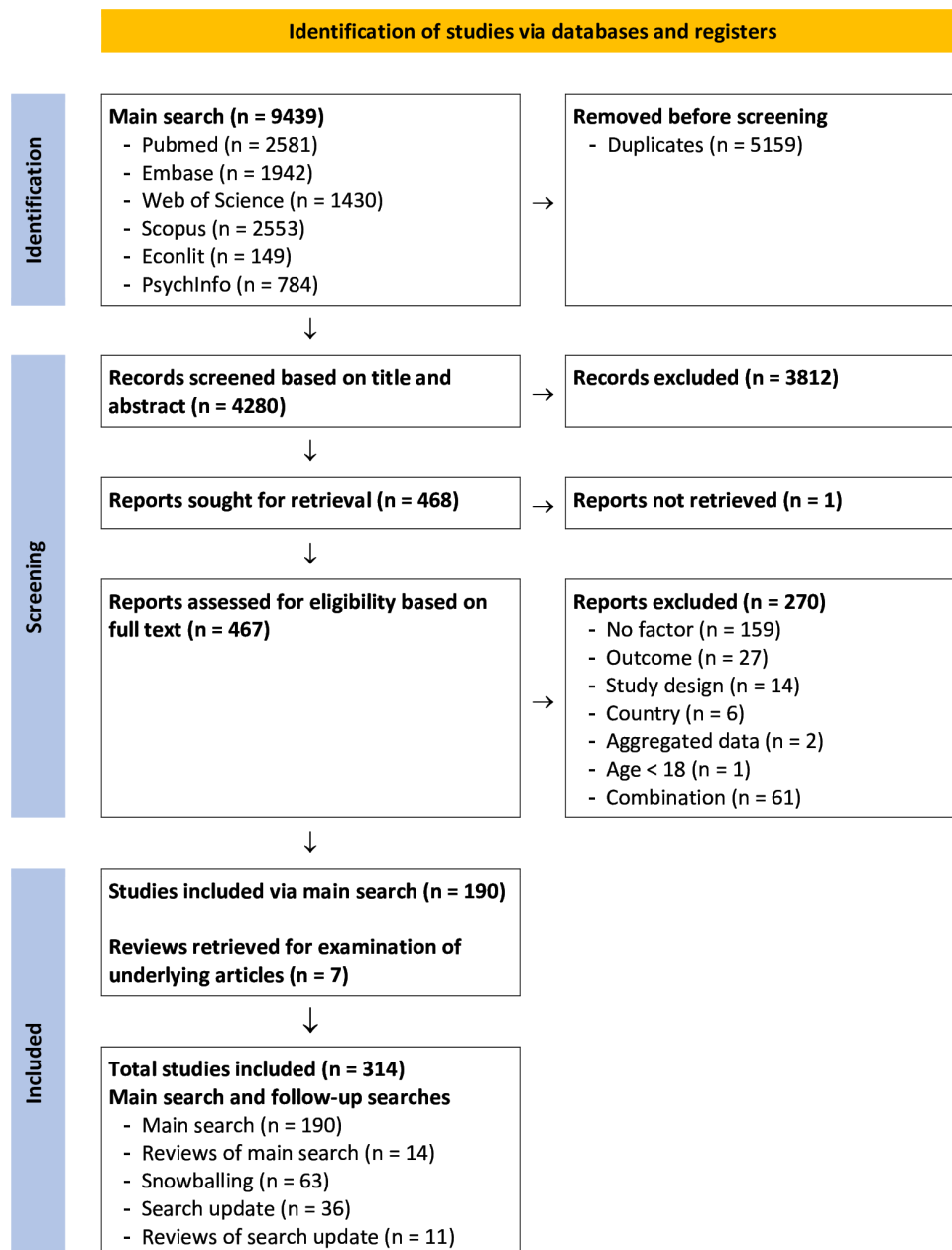


Figure 2 PRISMA flow diagram. Template from Page *et al.*²³ PRISMA, Preferred Reporting Items for Systematic review and Meta-Analysis.

RESULTS

Selection procedure

Figure 2 shows the compact flow diagram of the selection process. The detailed flow diagram can be found in online supplemental material 5, figure 1. The main search strategy resulted in 4280 articles after deduplication. 3812 articles were excluded after the title and abstract screening, resulting in 467 remaining articles. Full-text screening further excluded 270 articles. Kappa statistics ranged from 0.351 to 0.554, indicating moderate agreement.²⁸ Articles were excluded because of not examining a factor (n=159), examining an outcome outside the scope of this review (n=27), not applying the desired study design (n=14), locating in a non-OECD country and/or country without UHC (n=6), using only aggregated data

(n=2), examining a study population mainly younger than 18 (n=1), and a combination of two or more of these exclusion reasons (n=61). After the selection process, 190 articles were included in the review.

Thereafter, the three additional identification strategies were conducted. Seven relevant systematic reviews were found in the main search, of which underlying references were screened, resulting in 14 additional articles. Because the forward and backward snowballing procedure of the main search yielded 8498 additional unique studies (approximately 40 references per included article), a random sample of 10% (n=851) was taken to check the sensitivity and completeness of the study findings that emerged from the original search strategy. Forward and backward snowballing yielded 63 additional articles. The

search update until November 2022 yielded 36 additional articles and 11 additional articles from reviews retrieved within the search update (see figure 2 and online supplemental material 5, figure 1).

Overall, 7172 articles were screened, and 314 studies were included in this systematic review (figure 2).

Study characteristics

Table 2 presents the characteristics of the 314 included studies. Most studies were conducted on a general population (55% of the 314 studies), used self-reported data (55%), and had a cross-sectional design (75%). Most studies were located in Europe (59%), especially in Northern Europe, British Islands, and Southern Europe. The most frequent methods to examine the contribution of explanatory factors to SES differences in HCU were regression models (eg, stratified models, subsets, and the addition of confounders) (78%), concentration indices (CI) or horizontal indices (HI) (12%), and CIs/HIs with decomposition analyses (9%). Income was the most frequently examined SES indicator (60%).

Examined factors

Figure 3 shows the percentage of studies examining a specific factor on SES differences in HCU. 64% of the 314 studies included a measure of healthcare needs (health status, mental health status, or prior healthcare use). Furthermore, studies most often examined the contribution of sex (53% of the 314 included studies), age (48%), financial situation (25%), and education (22%). Here, financial situation is referring to factors that were indicators of a persons or households financial situation, such as income, home ownership, food insecurity, difficulties making ends meet, cash margins, wealth, material deprivation, or area deprivation index.

Categorisation into factor's level demonstrated that in 97% of the 314 included studies, the contribution of an individual-level factor was examined, while a minority of, respectively, 11% and 4% (also) examined the contribution of a community-level or system-level factor. Referring to the framework of Levesque *et al*,² 74% of the studies examined at least one of the individual abilities as potential barriers for access to healthcare. On average, 1.7 indicators of individual abilities were included per study. More specifically, 59% of the studies examined the ability to seek healthcare (sex, country of origin, capabilities, and language spoken), 36% the ability to pay for healthcare (financial situation, employment status, health insurance, social benefit systems, and social status), 28% the ability to reach healthcare (household composition, social contacts, urbanity, transportation, and neighbourhood characteristics), and 1% the ability to perceive healthcare (health literacy and health attitude). 68% of the studies examined at least one of the dimensions of accessibility that are potential barriers for access to healthcare. 58% of the studies examined acceptability (sex and country of origin), 21% availability and accommodation ((regional) healthcare characteristics and

Table 2 Characteristic of included studies (n=314)

Study characteristics	N	%
Population		
General population	174	55.4
Having an illness	67	21.3
Having certain sociodemographic characteristics	62	19.7
During last period of life	8	2.5
Living in an area with certain characteristics	3	1.0
Region		
Europe	185	58.9
North America (Canada)	49	15.6
Oceania (Australia)	29	9.2
Asia (South-Korea and Japan)	24	7.6
Multiple countries	14	4.5
South-America (Chile)	7	2.2
Middle East (Israel and Turkey)	6	1.9
Data collection method		
Self-reported	174	55.4
Registration	115	36.6
Registration+self-reported	25	8.0
Study design		
Cross-sectional	236	75.2
Longitudinal	78	24.8
Analyses method*		
Multiple regression models	230	73.2
Concentration index	39	12.4
Concentration index and decomposition analysis	29	9.2
Multiple regression models (with interaction)	14	4.5
Regression discontinuity design	1	0.3
Stratification analysis	1	0.3
SES indicators†		
Income	187	59.6
Education	137	43.6
Employment status	75	23.9
Composite measure	57	18.2
Wealth	15	4.8
Housing	10	3.2
Social class	7	2.2
Material deprivation	4	1.3
Publication year by region (earliest and latest)		
Europe	1978	2022
North America (Canada)	1996	2022
Oceania (Australia)	1988	2022
Asia (South-Korea and Japan)	2005	2022

Continued

Table 2 Continued

Study characteristics	N	%
Multiple countries	2000	2020
South-America (Chile)	2002	2017
Middle East (Israel and Turkey)	2006	2019

*Note that the analytical strategy of only a minority of the studies included significance testing or allowed for causal interpretation of the factor's contribution to SES differences in HCU.
 †One study may use multiple indicators of SES, so percentage adds up to more than 100%.
 HCU, healthcare utilisation; SES, socioeconomic status.

urbanity), 15% affordability (employment status) and 3% approachability (language spoken and received referral). Not all factors found could be placed in the framework of Levesque *et al*,² for example, age, lifestyle indicators, or stress indicators.

Figure 4 shows a heatmap of the number of studies that examined the contribution of a specific factor in relation to socioeconomic differences by type of healthcare. The most frequently examined types of care were outpatient care (41% of the 314 included studies), inpatient care

(37%), and primary care (28%). Corresponding with the findings in figure 3, health status was examined most often for almost all types of care. 26% of the studies accounted for health status in their research on SES differences in outpatient care use.

Contribution of factors to SES differences in HCU

22 studies met the criteria to quantitatively study the direction of the contribution of the factor to SES differences in HCU. The study characteristics and the detailed ROB assessment can be found in online supplemental material 6, table 2 and figure 2. Overall, 55% of the studies had a low ROB and 46% of the studies had a moderate ROB. 23% of questions were assessed as 'unclear'. An 'unclear' score negatively impacted the overall ROB score. Some studies, for example, had a more methodological aim, rather than presenting the results of quantitative analysis. Consequently, some aspects of data collection, processing, and checks were reported in less detail, limiting appropriate ROB assessment.

Figure 5 summarises the number of studies that reported a specific combination of factors, SES indicator(s), and the contribution of the factor(s). The first panel describes the results where a factor did not contribute

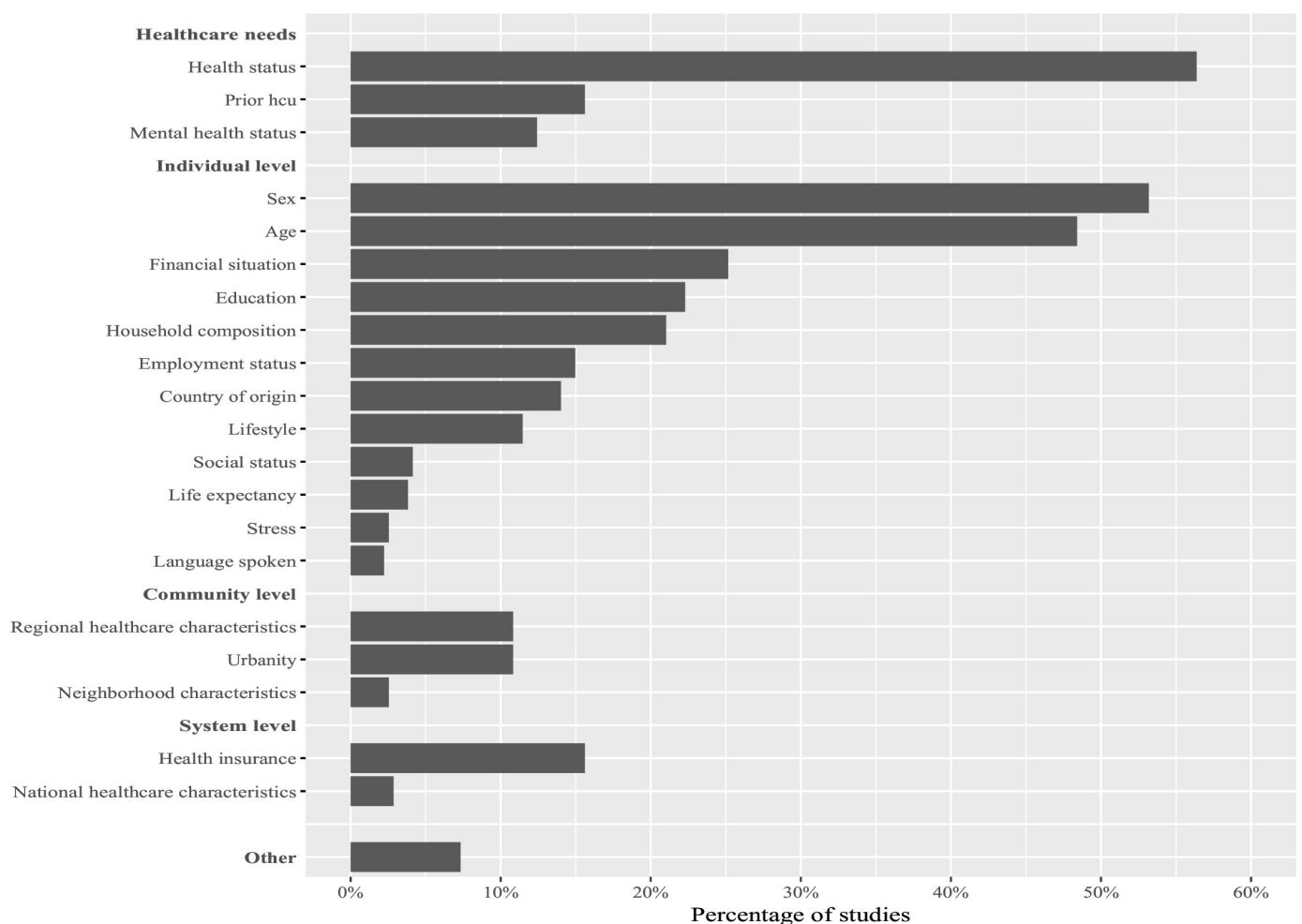


Figure 3 Distribution of examined factors in 314 studies ordered according to multilevel categorisation. Note that the percentages add up to more than 100% because one study can analyse multiple factors. HCU, healthcare utilisation.

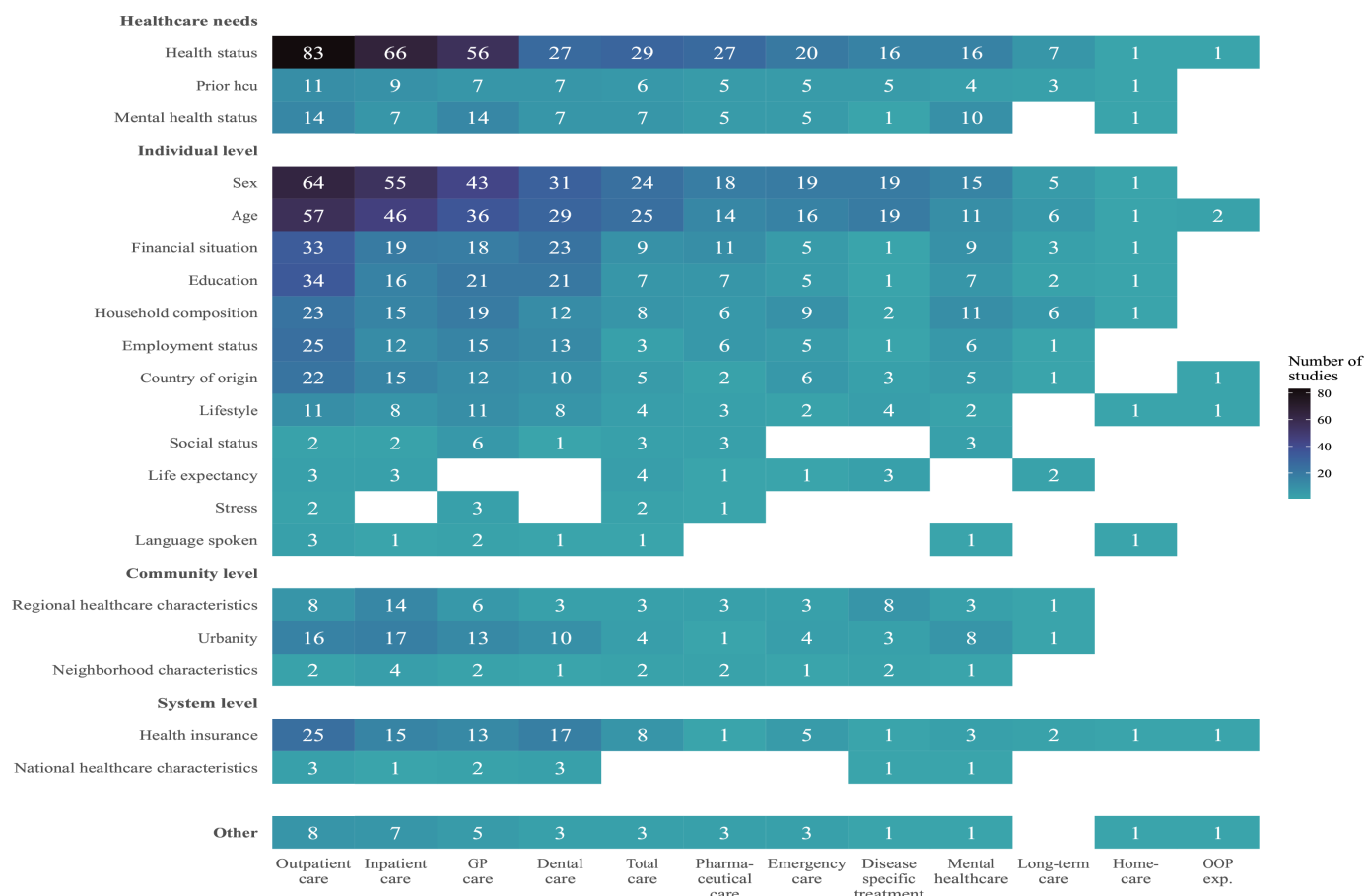


Figure 4 Heatmap of the number of studies that examined the contribution of a specific factor (Y-axis) to socioeconomic differences in a specific type of healthcare (X-axis). Note that the sum of the number of studies is more than 314 because one study can analyse multiple factors or outcome measures. HCU, healthcare utilisation.

to SES differences in HCU. The second panel describes the results where a particular factor level contributed to higher HCU among lower SES groups compared with its reference level. It describes two situations (not separately shown): either lower SES groups used more healthcare than higher SES groups at baseline and this association was statistically significantly stronger among the factor level, or lower SES groups used less care at baseline and this association was statistically significantly smaller among the factor level. The third panel describes the reverse contributions, where a particular factor level contributed to higher HCU among higher SES groups.

For most individual level factors, mixed results were found regarding the contribution to SES differences in HCU (figure 5). For example, five studies found that poorer health status contributed to higher HCU among higher income groups, four studies found that poorer health status contributed to higher HCU among lower income groups and six studies found no contribution to income differences in HCU. Results for country of origin were unambiguous: country of origin was reported not to contribute to SES differences in HCU in all studies examining this factor.

Community-level factors were rarely studied. Degree of urbanity, area deprivation index, and the degree of

provider competition per area were studied once, showing no contribution to SES differences in HCU. The system-level factors examined, out-of-pocket (OOP) payment (n=3) and provider choice (n=1), showed mixed results.

Sensitivity analysis

The variation in direction of contribution of the factors did not depend on the baseline SES differences, whether or not the study corrected for healthcare needs, or overall ROB score (online supplemental material 7, figures 3–5).

DISCUSSION

This review found a large body of literature studying factors contributing to SES differences in HCU. Of the 7181 articles screened, 314 were included in the review. 64% of the studies included a measure of healthcare needs. In addition, sex (in 53% of the included studies), age (48%), financial situation (25%), and education (22%) were mainly studied. Most individual-level factors demonstrated mixed results regarding the direction of their contribution to SES differences in HCU. Community-level and system-level factors were less often examined quantitatively compared with individual-level factors.

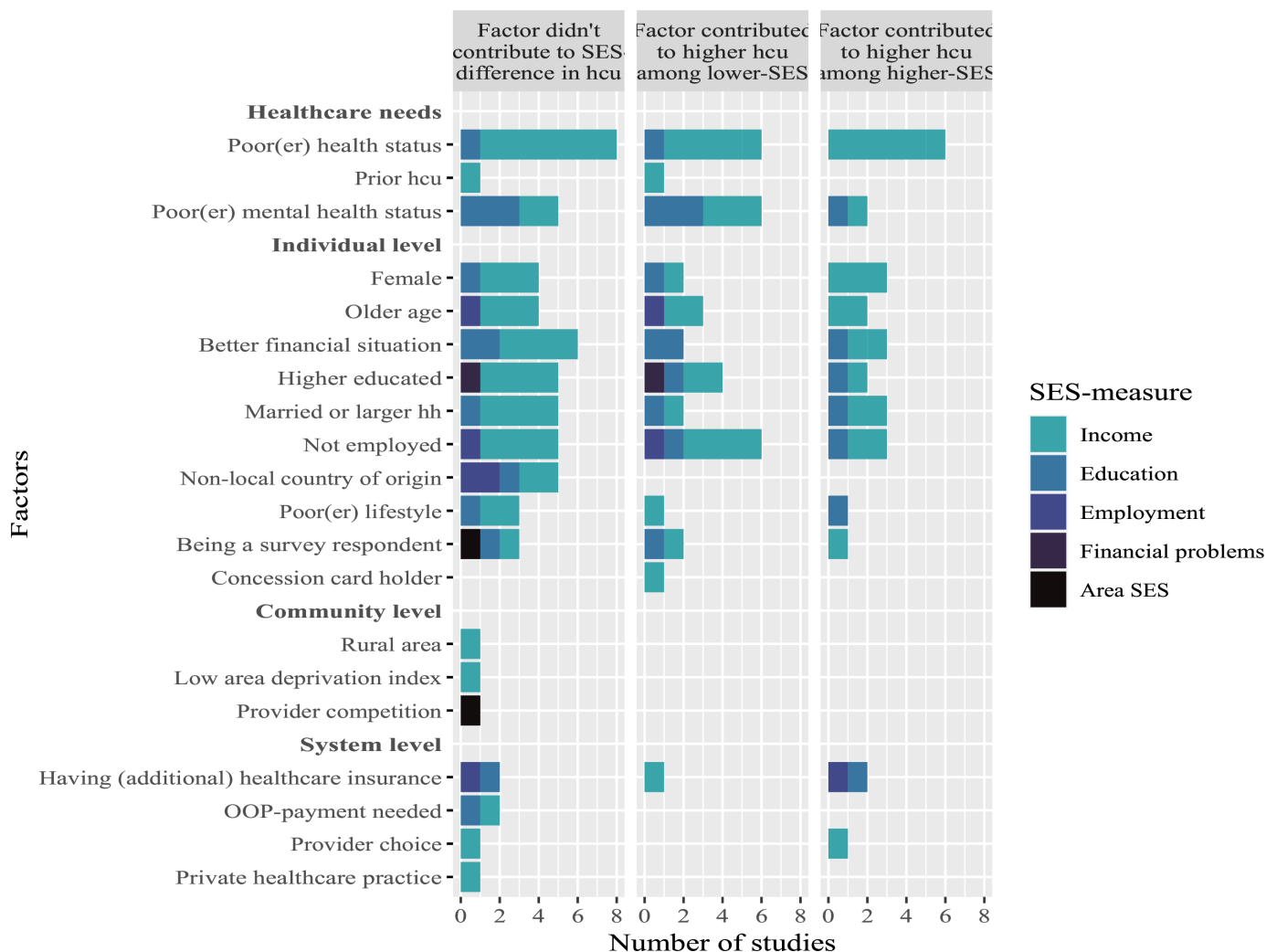


Figure 5 Harvest plot of the number of specific factors having an effect in the direction of a lower SES contribution, a higher SES contribution or no contribution to socioeconomic differences in a specific type of healthcare. The Y-axis showed individual-level, community-level, and system-level factors, whereas the X-axis counted the number of studies with a specific combination of factors and directions. The factor's reference categories (Y-axis) were, respectively, good health status, good mental health status, no prior healthcare utilisation, male, younger age, poorer financial situation, lower educated, not married or single person household, employed, local country of origin, good lifestyle, not being a survey respondent, no concession card holder, urban area, high area deprivation index, no provider competition, no or basic healthcare insurance, no out-of-pocket payment needed, no provider choice, and public healthcare practice. Note that the sum of the number of studies is more than 22 because one study can analyse multiple factors, outcome measures or SES indicators. HCU, healthcare utilisation; HH, household; OOP, out-of-pocket; SES, socioeconomic status.

Interpretation and comparison of the findings

When interpreting the findings using Leveque's theoretical framework, dimensions of accessibility have received less attention in quantitative literature than individual abilities. Although dimensions of accessibility were examined quantitatively in 68% of the studies (with an average of 1.1 indicator of dimensions of accessibility per study), this was for a large part driven by the inclusion of sex or gender as indicator of acceptability. Furthermore, quantitative research on socioeconomic differences in the ability to perceive and engage as barrier for HCU were also less common. A recent qualitative study in Austria indicated that, according to healthcare providers, researchers and experts by experience ((ex)patients), the ability to perceive needs and to subsequently seek and

reach healthcare services was an important barrier, especially among individuals with lower SES.²⁹ They suggested that system-level barriers disproportionately affect individuals with lower SES, as they had fewer financial and social resources to mitigate these barriers.

The limited number of studies researching the interaction between system-level and individual-level factors may result from the minimal variation in system-level factors among individuals or the lack of available data. To determine the role of healthcare system-level factors explaining SES differences in HCU at individual level, while mitigating potential biases like self-selection, quantitative studies predominantly rely on natural experiments, and cross-country comparison designs. However, extracting the contribution of healthcare system-level variables in



cross-country comparison studies can be subjected to unobserved variable bias reflecting other differences between countries. Nevertheless, the country comparison studies could be indicative of potential barriers of accessibility and abilities for HCU among lower SES groups. For example, Or *et al*³⁰ compared 13 European countries and showed that educational differences in HCU were smaller among countries with a National Health Service (NHS) system, general practitioners as gate-keepers, lower OOP payments, and higher public healthcare expenditure, while provider payment method and doctor availability did not seem to matter.

Levesque's framework for HCU (ability and accessibility to care) and the multilevel categorisation (individual-level, community-level, and system-level) together provided state-of-the-art insights into the most examined factors, provided guidance for the interpretation of these findings, and shed light on research gaps. However, parallels can also be observed with Andersen's behavioural model of HCU; where equitable access is defined as use of healthcare driven by need and demographic characteristics and inequitable access is defined as the use of healthcare driven by social structures, health beliefs, and enabling resources.³¹ With the use of Levesque's framework and multilevel categorisation, we aimed to provide more insights on the stages and levels at which factors could contribute to SES differences in HCU. Levesque's framework adapts a multidimensional view on the pathway to realised HCU, taking into account both a patient-level and system-level perspective, in which we felt Andersen's model was lacking details.

The findings indicated that in OECD countries with UHC, not only healthcare needs, but also other individual-level factors contributed to SES differences in HCU. The direction of contribution did, however, differ greatly between studies. Unfortunately, we were unable to determine why factors showed contributions in both directions. We eliminated the potential effect of baseline SES differences, correction for healthcare needs, and overall ROB score in the sensitivity analysis. The results may be equivocal because underlying mechanisms of SES differences were interacting with other factors or were context dependent (eg, because of large variation in study design, geographic location, time period, or adjusted confounders). For example, Raittio *et al*³² showed that the direction of contribution of education and marital status to income differences in dental care use changed over time. The context dependency of factor's contributions to socioeconomic differences was also noticed by Petrovic *et al*³³ in their systematic review on the contribution of health behaviours to socioeconomic differences in health. They indicated that the contributions of smoking, alcohol consumption, physical activity, and diet varied according to population and study characteristics. In our study, the large heterogeneity between included studies limited comparability and generalisability. Therefore, it was only possible to count the direction of contribution per factor and not to conclude on sizes of contribution or mechanisms.

A number of systematic reviews have been conducted on the contribution of factors to socioeconomic differences in health indicators (instead of HCU). Although most of these reviews also found heterogeneous results, they generally observed more substantial and unambiguous contributions. Petrovic *et al*³³ and Probst *et al*³⁴ found a negative contribution of smoking and alcohol consumption to socioeconomic differences in all-cause mortality. For socioeconomic differences in self-reported health status, work factors, lifestyle factors,³⁵ material factors, psychosocial factors, and behavioural factors³⁶ were found to contribute. On a system level, welfare state design did not seem to contribute to socioeconomic differences in mental health outcomes.³⁷

Research gaps and recommendations for researchers

Following the principle of equal access for equal needs, variation in HCU between different socioeconomic groups may be adequate if driven by different healthcare needs. Health status is often seen as indicator for healthcare needs in quantitative research, with equal access for equal needs being interpreted as equal access for equal health. Research into 'unjustifiable' SES differences in HCU should therefore correct for differences in healthcare needs or health status. Only 64% of the studies included in this systematic review examined the contribution of healthcare needs to SES differences in HCU. We recognise that this is subjected to data availability and it may be difficult for researchers to disentangle differences in healthcare needs and patient's preferences. For example, whether healthcare use of minorities is subjected to linguistic barriers or barriers in finding the right healthcare provider ('unjustifiable differences') and/or whether variation is due to differences in socially and culturally motivated preferences ('justifiable differences').³⁸

Large knowledge gaps were found with regard to the contribution of community and healthcare system-level factors to SES differences in HCU. Furthermore, it remained unclear if and how community and system-level factors interplayed with other personal characteristics among lower socioeconomic groups. For example, income differences in unmet healthcare needs because of (OOP) costs may be larger among the working age group compared with elderly.^{39,40} Researchers should, therefore, focus more on the relative contribution of community-level and system-level factors to SES differences in HCU. Furthermore, no conclusions could be drawn on how specific factors contributed to SES differences in HCU, because there were only a small number of studies found that could be used to assess the direction and significance of the factors' contribution to SES differences in HCU. Most studies compared regression models with and without adjustment for confounders. Estimates under this approach may be subjected to unobserved variable bias and lack causal interpretability. A majority of the studies performing a decomposition analysis did not test for significance of the factor's contribution, which hampered

the interpretation whether a factor contributed or not. Therefore, this study underlines the recent call of several European scientific committees to enhanced understanding of underlying mechanisms and causal explanations of differential health and healthcare use.⁴¹ To reduce these knowledge gaps, researchers should strive to increase the use of causal inference study designs, for example, mediation analyses, decomposition analyses, instrumental variable analyses, or system modelling.

Strengths and limitations

This systematic review on factors contributing to SES differences in HCU followed a prepublished and peer-reviewed study protocol enhancing transparency and consistency. With 7172 unique articles screened, it provides a comprehensive overview of the current literature on factors contributing to socioeconomic differences in healthcare use. Using the theoretical framework of Levesque *et al*² and categorising factors by individual-level, community-level, and system-level provided valuable insights into the frequently examined factors and research gaps.

However, this systematic review is subjected to several limitations. First, the backward and forward snowballing resulted in 8498 unique new studies. We were only able to screen and assess a 10% random sample (n=851) due to time limitations. This yielded 63 additional included studies. Therefore, we cannot guarantee an all-encompassing coverage. The 10% sample of backwards and forwards snowballing did not contain studies that met the additional criteria for quantitative analysis, indicating a fairly exhaustive coverage. Because the sample was drawn randomly, it has most likely not affected the order of commonly examined factors, but possibly less frequently examined factors might have been missed. Second, because the socioeconomic indicators were often a by-product rather than the main focus, studies with a more general perspective may have been missed by the search strategy. It is, however, nearly impossible to systematically include these studies when not mentioning all factors or determinants in their abstracts. Third, no country specific inclusion dates were used. Although these country may currently have UHC, studies may be conducted prior to the implementation. Finally, this review focused specifically on quantitative research on individual level. Insights from qualitative research, which could have advanced understanding of how factors contributed to SES differences in HCU, may have been missed. Differences in system-level factors are examined more frequently in cross-country comparison studies. Although these studies mostly do not take into account the individual perspectives, these cross-country comparison studies could have provided additional insights into consequences of healthcare system designs on an individual level.

Policy implications

Even among studies correcting for healthcare needs, no unequivocal patterns were found that could explain why

HCU differed between SES groups in OECD countries with UHC. On the one hand, this is reassuring as it indicates no systematic discrimination within the healthcare systems. On the other hand, no specific (set of) factor(s) could be pinpointed that policy makers could focus on for improving individual abilities and accessibility to care. As not all factors contributing to SES differences in HCU are modifiable, general policy strategies to improve abilities and reduce barriers to healthcare access, given the factors and dependent on equity considerations of policy makers, seem most efficient.

CONCLUSIONS

Our systematic review showed that in countries with UHC and social benefits schemes, the use of healthcare did not vary solely by differences in healthcare needs. Other factors, besides healthcare needs, contributed to observed SES differences in HCU, indicating that equal access for equal needs is not consistently accomplished. The association between SES and HCU seems to be highly content dependent as no unequivocal patterns were found of how individual-level, community-level, and system-level factors contributed to differences in HCU between SES groups. Most studies examined the contribution of individual-level factors to SES differences in HCU, leaving it undefined to what extent the (healthcare) system constraints individual abilities and enforces barriers for equal access for equal needs for individuals with lower SES. Further research should strive to enhance understanding of causal mechanisms underlying socioeconomic differences in HCU and to enhance understanding of the consequences and normative assessment of these differences.

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