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# Factors associated with accessing health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature



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# Factors associated with accessing health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature

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## ABSTRACT

**Objective**: To identify factors associated with healthcare-seeking behaviour, healthcare utilisation and provision of health services in slums.

**Design:** A scoping review incorporating a conceptual framework for configuring factors associated with access and provision of healthcare in slums.

**Data sources:** MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library were searched in April 2020 using slum related terms.

**Eligibility criteria:** Empirical studies of all designs reporting relevant factors in slums in low and middle income countries.

**Data extraction and synthesis:** Studies were categorised and data were charted according a preliminary conceptual framework refined by emerging findings. Results were tabulated and narratively summarised.

**Results:** Of the14,041 records retrieved from all years, 3895 records dated between 2016-2020 were screened by two independent reviewers and 92 studies were included. The majority (53 studies, 58%) were conducted in Asia, predominantly in India. Eighty-five studies examined healthcare access from slum residents' perspective while only eight studies explored provision of health services from providers/planners' perspective (one study included both). A multitude of factors are associated with accessing and providing healthcare in slums, including recent migration to slums; knowledge, perception and past experience of illness, healthcare needs and health services; financial constraint and competing priorities between health and making a living; lacking social support; unfavourable physical environment and locality; sociocultural expectations and stigma; lack of official recognition; and problems in existing health system.

**Conclusion:** The scoping review identified a significant body of recent literature reporting

factors associated with access and provision of healthcare services in slums. We classified the diverse factors under seven broad categories. The findings can inform a holistic approach to improving health services in slums by tackling barriers at different levels, taking into account local context and geospatial features of individual slums.

**Systematic review registration:** Open Science Framework (OSF, https://osf.io/694t2)

**Keywords:** slum, informal settlement, scoping review, healthcare-seeking behaviour, healthcare utilisation, health service delivery

Strengths and limitations of this study

- We conducted literature search in multiple databases using generic terms related to slums to ensure that a wide range of relevant studies was captured.
- A conceptual framework explaining factors associated with healthcare seeking behaviour and healthcare utilisation of slum residents as well as provision of healthcare in slums was developed and used to categorise identified studies and factors.
- We examined barriers and facilitators of healthcare access and service provision from the perspectives of both demand side (slum residents) and supply side (healthcare providers and service planners).
- Only studies published between 2016 and 2020 in English language were included, and methodological quality of each included study was not examined because of time constraint.
- We did not explore the complex relationships and interactions between various factors at different slum locations, but our mapping of these factors to the conceptual framework should facilitate further in-depth analyses.

# INTRODUCTION

Rapid urbanisation has resulted in a growing number of residents in slums[1] who face ongoing problems such as unemployment, poor sanitation, lack of transport, high level of crime, and haphazard development.[2] In 2018, over one billion people were living in slum-like conditions, and Central, South and South-East Asia and Sub-Saharan Africa accounted for 80% of them.[1] Even though various definitions of slums exist, there is no universally agreed definition of what constitutes 'a slum', and the term itself is widely debated and contested.[3 4] For the purpose of this scoping review, we refer to slums as densely populated areas characterised by lack of basic services, substandard housing, overcrowding, unhealthy living condition, insecure tenure and poverty,[4 5] taking into account the crucial concepts of place and space that are important in shaping health outcomes and community access to health services in these urban settings.[4]

Previous studies have reported various risk factors affecting health of slum residents such as physical environment,[6] sanitation,[7] social capital[8 9] and water governance,[10] and have observed in some cases that slum residents have worse health status compared to non-slum urban and/or rural residents. For example, Ezeh et al. found that children living in slums had higher mortality than rural and non-slum urban populations.[3] Poorer height-for-age for children[11] and higher prevalence of childhood illnesses and malnutrition[12] have also been observed in slums compared to non-slum urban and rural settings. In addition, slum residents are susceptible to unhealthy behaviours.[13 14] Living in slums has been found to be associated with low physical activity,[13] poor diet,[14] and poor knowledge about the cause and preventability of diseases.[15]

Despite the unfavourable health status and environment, and consequently the potential high level of healthcare needs, previous studies showed that slum residents were less likely to seek and use healthcare services than their non-slum counterparts in the cities.[16 17] Slum residents have been found to have lower rates of healthcare utilisation in antenatal services[16] and services

for non-communicable diseases[17] compared to residents of urban 'formal' settings. One study in Iran showed that only about half of slum households that required outpatient services could use them.[18] Another study in Haiti also reported that one third of slum households were not able to access medical care for their children when it was needed in the past year.[19]

While the health status and needs of slum residents have been described in previous reviews,[3] [20] factors associated with healthcare seeking behaviour and healthcare utilisation of slum residents and factors related to the provision of health services in slums have not been systematically examined (with the exception of immunisation services).[21] This scoping review aims to fill in these evidence gaps and inform efforts to improve healthcare delivery to people in slums.

## METHODS

This scoping review was performed according to current best practice guidance.[22] The broad question of interest was: "*What factors are associated with slum residents' care seeking behaviour and access to health care and/or the provision of health services in slum settings in low and middle income countries (LMICs)*?" The protocol for this review was registered in Open Science Framework (OSF).[23]

### Literature search and study selection

A comprehensive search of five databases: MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library was conducted in April 2020. Searches were limited to English language. Key terms related to slums were used: slum or slums or ghetto or ghettos or informal settlement$ or shantytown$ or shanty town$ or favela$. We did not include terms related to

other concepts in order to maximise the sensitivity of our searches.

Records retrieved from databases (after duplicates were removed) were initially screened by one reviewer (JEP) and those which did not meet the inclusion criteria were disregarded. After that, a second reviewer (PK, GY, OO) examined the remaining records independently based on titles and abstracts. When the decisions of two reviewers differed, the discrepancy was resolved based on full-texts and/or by discussion with a third reviewer (YFC) or the broader review team. This study screening process started from records of the most recent years (i.e. in the past three years) and then proceeded to prior years. Due to the larger than expected volume of the literature, we eventually screened records between 2016 to 2020 and did not cover earlier records in order to synthesise and present the findings from latest evidence in a timely fashion to inform the wider project hosting this review.[24 25]

**Inclusion and exclusion criteria**

A study was included when it: (1) described factors related to slum residents' healthcare seeking behaviour or access to health care or the provision of health services in slums; and (2) was conducted in relation to slums in LMICs. Only articles written in English were included. A study was excluded when it was a commentary, opinion, or narrative review; described slum residents' access to health services or the provision of health services without exploring the associated factors; investigated informal care at home; or included mixed slum and non-slum populations without separately reporting data for slum residents or investigating residency in slums as a factor for healthcare access.

We included both primary studies and systematic reviews that examine data collected empirically and that derive their findings based on the data. Both quantitative and qualitative studies (and by extension, mixed methods studies) were considered. Even though slums have

existed in both high-income countries and LMICs, the context may be quite different between these countries. For example, while all slums are vulnerable to natural disasters such as tropical cyclones, the impact of these could be far more severe in slums of LMICs due to the different socioeconomic contexts.[26] In this review, we focused on settings in LMICs and excluded studies conducted in high-income countries.

**Study coding and data extraction/charting**

Eligible studies were coded and data-extracted/charted according to a pre-specified, preliminary framework shown in Figure 1 below. The preliminary framework was developed by the review authors based on existing conceptual models related to healthcare access and service delivery[27-30] and was modified during the scoping review process to accommodate new factors/themes identified from the literature.

Based on the conceptual framework, each eligible study was coded as being associated with one or more of the three phenomena of interest, namely slum residents' healthcare-seeking behaviours (which covered both perception of needs/desire for care and actual health care seeking), health care utilisation (which covered healthcare reaching[29] and utilisation) and provision of health services (which covered various arrangements related to service delivery) in slum settings (Figure 1).

In addition, to facilitate the organisation of complex evidence in this review, diverse factors were initially classified into six different categories according to the preliminary framework shown in Figure 1. The framework was refined to reflect emerging themes during the coding and data extraction/charting process. The final framework is shown in Figure 2 and contains seven categories:

(1) Personal and biological factors: these relate to personal characteristics of slum residents,

including age, sex, ethnicity and the nature and severity of health conditions.

(2) Cognitive and experiential factors: these relate to personal awareness, knowledge, perception, attitude, belief and experience etc. formed through cognitive process based on upbringing and past events.

(3) Socioeconomic factors: these include income and wealth, economic hardship/poverty and economic opportunities, marital status, education, crime, social capital (such as bonding, trust and reciprocity between close relatives, neighbours and community members),[31] use of technologies for social and economic purposes, commercial and charitable organisations and activities.

(4) Physical environment: this covers natural environment such as proximity to a health facility, built environment and infrastructure such as water supply, transport and mobile/internet networks, as well as weather conditions and environmental pollutions.

(5) Cultural and religious factors: these include cultural and religious beliefs and activities, and local and national customs.

(6) Legal, political and policy factors: these include government policies and issues related to legal, justice and political systems.

(7) Health system factors: these relate to historical and current organisation and provision of health care that may impact upon provision and delivery of health services in individual slum communities and the services experienced by slum residents.

Data on study population, study design, country in which the study was conducted, methodology, and associated factors were extracted using a data-charting spreadsheet which was developed and continuously updated as the review progressed by two of the reviewers (JEP and YFC). Whether a study was conducted exclusively within slums and whether a comparison was made between slum and non-slum urban or rural residents were also noted.

Coding of phenomena and factors and data-charting were conducted by one reviewer (JEP) and checked by a second reviewer (PK, GY, OO, YFC). Disagreements were discussed between reviewers until consensus was reached.

### Patient and public involvement

Given the focus of this scoping review on published literature, we did not directly involve residents and service providers/planners from slum settings. Nevertheless, our wider project has a work package that specifically engages with slum residents and service providers and planners,[24] and early plans and findings of this review were shared with the wider project team who provided comments based on their experiences of community engagement.

## RESULTS

The reporting of this review follows the PRISMA Extension for Scoping Reviews (PRISMA-ScR).[32] Using the search strategy described earlier, a total of 21,248 records were retrieved, with 14,039 records (Medline 3340, Cochrane 129, Embase 1626, CINAHL 323, Web of Science 8621) remaining after excluding duplicates. Two additional articles[18 33] were identified from references of the included studies. As described earlier, screening was limited to the 3895 records published from 2016 onwards.

A total of 92 articles were included in this scoping review. (Figure 3) Twenty-nine studies reported factors associated with healthcare-seeking behaviour of slum residents, 58 studies reported factors related to healthcare service utilisation, and eight articles reported the factors related to provision of healthcare services in slums (three studies reported factors related to more than one phenomenon of interest). Fifty-nine of the 92 studies were quantitative studies,

19 studies were qualitative studies, and 12 studies were undertaken using mixed-methods. The remaining two studies were systematic reviews. A total of 33 (36%) studies were conducted in India, followed by Kenya (11 studies, 12%). (Table 1)

Table 1. Characteristics of included studies.

| Category | Subcategory | | Number of studies (%) |
|---|---|---|---|
| Publication year | 2016 | | 22 (24) |
| | 2017 | | 17 (18) |
| | 2018 | | 23 (25) |
| | 2019 | | 22 (24) |
| | 2020 | | 8 ( 9) |
| Analysis method | Quantitative | | 59 (64) |
| | Qualitative | | 19 (21) |
| | Mixed-methods | | 12 (13) |
| | Narrative synthesis | | 2 ( 2) |
| Study location | Asia | India | 33 (36) |
| | | Bangladesh | 9 (10) |
| | | Nepal | 4 ( 4) |
| | | Myanmar | 2 ( 2) |
| | | Pakistan | 2 ( 2) |
| | | Iran | 2 ( 2) |
| | | Sri Lanka | 1 ( 1) |
| | South America | Brazil | 5 ( 5) |
| | | Peru | 2 ( 2) |
| | Africa | Kenya | 11 (12) |
| | | Ethiopia | 5 ( 5) |
| | | Malawi | 4 ( 4) |
| | | South Africa | 2 ( 2) |
| | | Uganda | 2 ( 2) |
| | | Sierra Leone | 1 ( 1) |
| | | Nigeria | 1 ( 1) |
| | | Egypt | 1 ( 1) |
| | | Zambia | 1 ( 1) |
| | | Namibia | 1 ( 1) |
| | | Ghana | 1 ( 1) |
| | North America | Haiti | 1 ( 1) |
| | Multiple nations | | 1 ( 1) |
| Healthcare services in slums* | Healthcare-seeking behaviour | | 29 |
| | Healthcare service utilisation | | 58 |
| | Provision of healthcare services | | 8 |
| Total | | | 92 (100) |

* One study reported factors related to both healthcare-seeking and healthcare utilisation and two studies reported factors related to both healthcare utilisation and provision of healthcare services

Participants, country, study design, methodology, observed phenomena and outcomes, and factors of interests for each study are described in supplemental tables 1-3. Supplemental table 1 shows 29 studies reporting factors associated with general healthcare seeking behaviours; healthcare seeking for children or women; slum residents' preference for healthcare providers; and healthcare seeking related to HIV testing. Supplemental table 2 presents various factors reported in 58 studies related to general healthcare utilisation as well as use of specific services such as childhood immunisation, maternal healthcare, and possession of health insurance. In Supplemental table 3, eight studies reporting factors related to the provision of health services in slums are summarised. Key findings are described below.

**Demand side: Factors associated with healthcare-seeking behaviour and healthcare utilisation of slum residents**

We found 86 articles which identified many different factors affecting healthcare-seeking behaviour and utilisation. These factors are often inter-related and exert their influence at different levels (e.g. from personal, family to community level) in different circumstances. We classified various factors into seven categories (Figure 2). Factors particularly relevant to slum settings and other commonly identified factors within each category are highlighted below.

Personal and biological factors: major life events such as recent migration[21 34-37] and relocation[38] into slums tend to be associated with lower healthcare seeking and utilisation. Recency of migration to slums was also related to uptake of Rashtriya Swasthya Bima Yojana (RSBY), a national health insurance programme run by the Indian government.[39] Other common factors associated with healthcare seeking and utilisation included intrinsic factors such as age,[21 37 38 40-48] sex,[18 21 42 45 49-51] and ethnicity,[21 47] familial factors such as birth order of the sick child,[21 41 47 52-54] or number of male children in the family;[55] as well as personal health and the specific features of the health condition such as fever, tachypnoea, chest in drawing, persistent vomiting,[44 45 56] type of illness,[49] disability[46] and morbidity.[21 42 57] One study showed that tobacco habits and family history of cancer were associated with attending cancer screening test.[43]

Cognitive and experiential factors: these factors were not included in our initial conceptual framework but rather emerged inductively from our data. Consequently, their identification led us to revise the conceptual framework for this scoping review. A wide range of factors formed through cognitive processes and influenced by individual's upbringing, past experience and surrounding environment were reported to be associated with both healthcare-seeking and healthcare utilisation of slum residents. Perception,[36 40 44 48 58-64] knowledge[44 47 65-69] and

experience of symptoms and illnesses[48] were commonly found to influence healthcare seeking and utilisation. Denial, complacency, fear of death were reported as reasons that participants did not get HIV test.[59] Ability in managing the condition at home[44 70] such as home remedies[58] and perceived need for accessing healthcare services [21 33 36 45 62 63 71 72] also affected healthcare-seeking and healthcare utilisation among slum residents. In addition, perception,[21 63 70 72-79] knowledge,[21 36 38 53 62 72 73 80 81] and experience of healthcare services[35 37 40 43 52 54 62 67 82-84] including fear and distrust of healthcare services,[21 33 36 59 62 63 66 76 85-87] and preference related to care provider's gender[75 88] were frequently cited factors. Provider shopping associated with distrust of healthcare providers and denial of diagnosis delayed first care seeking and treatment initiation of pulmonary tuberculosis patients in India.[58] Perception or experience of healthcare services also affected uptake or renewal of health insurance.[78 81]

Socioeconomic factors: income and wealth[34 36-38 45 48 50 53 68 89-93] including financial constraint [19 21 33 61 64 66 70 71 74 77 83 87 94-96] featured prominently. The socioeconomic challenges faced by slum residents also manifested as competing priorities [61 72 97] and lack of time[21 87 98] for healthcare-seeking and utilisation, because they did not want to or could not afford to miss work and lose income.[21 58] These were exacerbated by lack of social support,[62 64 72 75 86 99] which was linked to further barriers such as not being able to seek healthcare due to security at night.[86] Other socioeconomic factors reported included social class,[21 40 41 47 51 54 93 94 100 101] marital status,[18 43] family composition,[21 35 38-40 48 55 102] education,[21 34-36 38 40 41 43-45 47-54 68 69 89 92 93 101-103] occupation,[35 38 39 43 48 50 53 68 69 91] and employment.[21 34 78 104]

Physical environment: Slum residents considered proximity of healthcare facilities,[21 33 41 64 68 70 73 79 93 105-107] transport such as travel assistance,[64] lack of transportation[33 69 94], traffic congestion,[108] and environment of residence area when they sought and used healthcare services.

Cultural and religious factors: these included religion;[43 51 52 63 101] sociocultural influence[72 88] such as exposure to media[67 84]; stigma associated with unplanned/extramarital pregnancy[66 72] postpartum depression[109] and other illnesses such as contagious skin disease, barrenness and female sexually-related problems;[88] and use of traditional/home medicine.[63 83 86] Women in slums could not go to hospital because they had difficulties in disclosing the symptoms, postponed their health issues because of their responsibilities at home, and engaged in self-treatment practices such as home remedies recommended by grandmother and friends because because of socio-cultural influences toward healthcare-seeking behaviour.[65] Women in Ethiopia reported not returning to postnatal care due to religious and cultural expectation for mother and baby to stay home for 80 days after birth.[72] One Indian survey showed that some women could not seek healthcare services during labour since their husband or family did not allow that.[33]

Legal and political factors: type of slums (in terms of official recognition and availability of basic facilities) and possession of a ration card were found to be associated with uptake of the Indian RSBY a national health insurance programme.[39] One study reported that slum residents could not seek healthcare facilities for abortion because of the perceived illegality of abortion.[66]

Health systems: slum residents were also influenced by many factors related to health systems when they sought healthcare. These included accessibility associated with the location[21 88] and timing of services;[21 70 83] quality of healthcare services[33 35 71 73 79 83 88] such as delay in advising patients to go for related tests or referral,[58] likelihood of receiving appropriate examination,[70 95] and adverse events.[63] Slum residents considered service organisation including medical turnover,[110] availability of supplies/healthcare workers,[41 70 71 95] attitude of healthcare providers,[83] type of healthcare facilities,[33 73 103 111] and waiting time.[60 70 73 74 83 95 112] In an Ethiopian study, some participants reported unavailability of female birth attendants as a

reason for not delivering at healthcare facilities.[71] (Table 2)

Table 2. Factors associated with healthcare-seeking behaviour and healthcare utilisation in slums.

| Factors | Healthcare seeking | Healthcare utilization |
|---|---|---|
| Personal and biological factors | | |
| Age | Age[43-45] | Age[21 37 38 40-42 46-48]; age of household head[18] |
| Gender | Sex[45 49 50] | Sex[18 21 42 49 51] |
| Ethnicity | | Ethnicity[21 47] |
| Migration | | Recent migration[21 34-37]; relocation[38]; return to home village[21] |
| Biological | Symptoms such as fever, tachypnea, chest in drawing, persistent vomiting[44 45 56] | Type of illness[49]; disability[46]; morbidity[21 42 57] |
| Other personal | Tobacco habits [43]; family history of cancer [43]; family history of cancer [43] | Birth order of sick child [21 47 52-54]; parity [41 57] |
| Cognitive and experiential factors | | |
| Knowledge/experience of symptoms and illnesses | Perception of symptoms[58] or illness[44 60 64]; knowledge of symptom/disease[44 65 66]; denial and complacency[59] | Experience of child death[48]; planned pregnancy[48]; perceived health status[48 78] and health problem[36 40 61-63]; knowledge of symptom[69] or disease[47 67 68] |
| Ability/experience in handling health related conditions and perceived needs for accessing health services | Awareness of the need for healthcare services[33 45]; home remedies[58] or management of childhood illness[44 70] | Perceived needs for healthcare services[21 36 62 63 71 72] |
| Perception/knowledge/experience/preference of health services | Fear of mistreatment[59 87] and doubts about medical care[33 66 86]; gender-induced affordability[88]; provider shopping[58]; history of cancer screening[43] | Perception of healthcare services[21 63 73 75-78] and providers[21 70 72 74 79]; knowledge of health services[21 36 38 53 62 72 73 80] or facilities[21 81]; experience of healthcare services[37 62 82 83]; experiences of friends and relatives at healthcare facilities[81]; previous use of related healthcare services[35 37 40 52 54 67 84]; misunderstanding or fear[21 36 62 63 76 85]; gender healthcare worker preference[75] |
| Socioeconomic factors | | |
| Socioeconomic status | Social class[100] | Socioeconomic status[21 40 41 47 51 54 94]; Caste[93 101]; residential background[21 39 41]; possession of ration card[39] |
| Marital status | Marital status[43] | Marital status[18] |
| Family composition & Living arrangement | | Family type[40 48 102]; family size[35 39]; number of children in household[21 38]; number of male children[55]; type of residence[47]; housing condition[21] |
| Education | Education[43-45 50] | Education[34-36 38 40 47 49 51 53 54 68 69 89 92 93 101-103]; husband education[48]; mother's education and literacy[21 41 51 52] |
| Income and wealth | Income[45 90]; wealth[50]; inability to | Income[36 37 48 68 91]; wealth[21 34 38 53 89 92] |

| | | |
|---|---|---|
| | afford care [19 33 64 66 70 77 87 95 96] | [93]; financial constraint[21 61 71 74 83 94 113] |
| Occupation | Occupation[43 50] | Employment[21 34 78 104]; occupation[35 38 68 69 91]; occupation of spouse[48 53] or household[39] |
| Social support | Difficulty in reaching services (security risk at night)[86]; accompanying person[64] | Family support[62 75]; social connectedness[72]; socioeconomic support[99] |
| Competing priorities/lack of time | Competing priorities (ability to work and income)[97]; not want to miss work[58]; lack of time[87 98] | Competing priorities[61 72]; risk of lost income[21]; parents being too busy[21] |
| Physical environment | | |
| Distance from health facility | Proximity of healthcare facilities[33 64 70 105]; geographical distance of formal healthcare[88] | Distance from health facility[21 41 68 73 79 93 106 107] |
| Transport | Travel assistance[64]; no transportation[33] | Lack of transportation[69 72 94]; variability in traffic congestion[108] |
| Environment of residence area | Difficulty in reaching services (darkness at night)[86] | Residential background[21 39] |
| Cultural and religious factors | | |
| Religion | Religion[43] | Religion[51 52 63 101] |
| Sociocultural influence | Stigma[66 88 109]; mother tongue[43]; difficulties in disclosing the symptoms, neglecting behaviours, and socio-cultural influences[65]; cultural competency of care[88]; easy communication[88]; living with the burden of cultural expectations[88]; no permission to seek care from family[33] | Exposure to media[67 84]; cultural expectation for women after birth and fear of stigma for pregnancy out of wedlock[72] |
| Tradition | Traditional medicine[86] | Traditional remedies[63]; home remedies[83] |
| Legal, political and policy factors | | |
| Legal issues | Perceived illegality of abortion[66] | Type of slums and possession of a ration card[67] |
| Health system factors | | |
| Accessibility | Ease of access[88]; late facility opening times[70] | Limited access to the services due to location[72]; timing of services[21 83]; healthcare insurance[18 69]; household visit by health workers[21] |
| Quality and safety of services | Quality of treatment and expected outcome of therapies[33 88]; delay in advising related tests[58]; referral[58]; optimal examination[70 95]; provider shopping[58] | Quality of service[35 71 73 79 83]; adverse events[63] |
| Service organisation and delivery arrangement | Medical turnover and overload or healthcare providers[110]; government/NGO facility[90]; private hospital[33] | Attitude of healthcare providers[83]; mode of delivery[40 47 51 52 57 114]; hospitals refused to accept health insurance cards[81] |
| Facility & resources | Availability of medicines and supplies[70 95]; lack of healthcare facilities[115] | Type of healthcare facility[73 103 111]; number of available healthcare workers[41]; unavailability of female birth attendants[71] |
| Waiting time | Waiting time[60 70 95] | Waiting time[73 74 83 112] |

**Supply side: Provision of healthcare services**

Eight articles described factors associated with provision of healthcare services in slums from the service providers' perspective. None of the studies reported personal and biological factors. Factors related to other categories are summarised below.

Cognitive and experiential factors: Odhiambo et al. reported slum residents' fear of side effects, size of tablet and misconceptions regarding treatment as the factors hindering drug administration activities by healthcare workers for a deworming programme in Kenya.[116] On the other hand, this study also reported a high demand for drugs from slum residents in the final year of this program because people realised that free treatment was to be ended.[116]

Socioeconomic factors: effective community mobilisation was a facilitator[116] whereas poor community support[117] and insufficient time allocated for providers to implement healthcare programmes[116] were barriers for provision of healthcare services in slums. In the deworming programme mentioned above, community health workers reported that direct observation of slum residents taking deworming drugs after meals was sometimes not feasible because slum residents skipped or age late at night due to food shortage.[116] Some slum residents demanded money to take the deworming drugs, either to facilitate purchase of food or to have their own share of the money that they perceived the community health workers would be paid by the programme if they complied with taking the drugs.[116]

Physical environment: poor sanitation,[116 118] presence of rodents and no pavement,[118] and bushy and unprotected environment[116] were reported as factors making the provision of healthcare services difficult in slums.

Cultural and religious factors: religious beliefs and mistrust of interventions,[116] lack of a shared understanding of the needs, purposes and consequences of family planning and pregnancy related services among slum residents and healthcare providers[61] were the barriers

for healthcare services provision. In the previous deworming programme, portrayal of unrelated death being linked to the programme and related negative publicity affected participants' compliance.[116]

Legal and political factors and policy: devolution of service delivery through downward transfer of funds and responsibilities from central/national government level to elected local bodies; management by professional managerial and technical cadres; tight organisation of public health services; and professional support from the state directorate of public health were found to strengthen public health service provision in Chennai slums compared with Delhi.[119] One study reported that policies affected healthcare provision negatively because of staff shortage arising from change and suspension of the appointment of health promotors, which led to overwork and lack of time to provide required care by healthcare staff. [112] In Brazil, home visits for the provision of healthcare services was hampered because slum residents could not present documents required to register for healthcare.[118] On the other hand, giving priority to socially less developed areas for strengthening the Family Health System in Brazil might have been associated with better service coverage for slum residents with tuberculosis compared with their urban non-slum counterparts.[120]

Health system: pay scale of frontline healthcare workers,[117] knowledge of intervention area by community health workers,[116] issues related to rigid task assignment by service managers,[118] requirement to follow standardised protocol,[118] demands from the management,[118] work burden[112 118] and no incentive,[117] insufficient time,[116] attitude[61] and support of healthcare providers[117] were associated with healthcare service provision in slums. Lack of community-based care (such as school-based education for reproductive health and community support networks for women),[112] affordability (price) and availability of medicine,[121] limited medical supplies[61 117] and infrastructural facilities,[117] inadequate space and equipment[118] also affected

service provision. (Table 3)

Table 3. Factors associated with provision of healthcare services in slums

| | |
|---|---|
| Cognitive and experiential factors | |
| Perception/knowledge/experience/preference of health services | Fear of side effects, size of tablet and misconceptions regarding treatment, high demand for drugs in the final year of treatment[116] |
| Socioeconomic factors | |
| Income and wealth | Difficulty in directly observing deworming treatment at meal time due to food shortage[116] |
| Social support | Effective community mobilisation[116]; poor community support[117]; absence of community members during the drug administration exercise[116]; demand for incentives by community members to take deworming drugs[116] |
| Physical environment | |
| Environment of residence area | Environment (sanitation, territory)[118]; unsanitary environmental conditions[116]; inaccessibility (filthy and bush environment)[116] |
| Cultural and religious factors | |
| Religion | Religious beliefs and mistrust of interventions[116] |
| Sociocultural influence | Lack of shared understanding of the problems in community[61]; unrelated death and the associated negative publicity (of a deworming programme) by the media[116] |
| Legal, political and policy factors | |
| Policy issues | Devolution of service delivery transferring funds and responsibilities to elected local bodies [119]; management by professional managerial and technical cadres[119]; tight organisation of public health services[119]; professional support from the state directorate of public health[119]; healthcare policies[112]; policy prioritizing low social development areas [120] |
| Legal issues | Fear of requirement for formal registration[118] |
| Health system factors | |
| Cost | Pay scale of frontline healthcare workers[117]; medicine price[121] |
| Quality and safety of services | Knowledge of intervention area by community health workers[116] |
| Service organisation and delivery arrangement | Issues related to assignment of tasks[118]; requirement to follow standardised protocol [118]; demands from the management[118]; work overload[112 118]; documentation work/work burden/no incentive for work[117]; insufficient time[116]; attitude of healthcare providers[61]; lack of supportive staff[117]; community health worker familiarity with households led to warm reception[116]; opportunity to integrate mass drug administration with other health interventions[116]; presence of community health workers and their supervisory structure, and points of referral for serious side effects[116]; |
| Facility & resources | Community-based care[112]; affordability and availability of medicine[121]; limited medical supplies[61 117]; infrastructural facilities[117]; inadequate space and equipment[118] |

## Comparison between slums and other settings

Six studies which met our inclusion criteria also included data from non-slum urban and/or rural areas and potentially allowed exploration of factors associated with healthcare access across different settings. Key findings from these studies are summarised in Table 4.

These recent studies showed a mixed and dynamic picture of healthcare access across slum and other settings and reported various factors associated with this. For example, the proportion of young children fully immunised was found to be lower in slums compared with non-slum urban setting but was higher than rural settings in Nigeria. Nevertheless the coverage improved over time across all settings.[52] While many common factors associated with full immunisation of young children were identified, giving birth in health facilities (as opposed to home) had a larger positive effect on subsequent immunisation coverage in slums compared with non-slum urban and rural settings.[52] A narrowing of gaps in delivery by skilled birth attendants between slum and non-slum urban settings over time and a reverse of the trend from having lower usage to higher usage of modern contraceptive methods by married women in slums versus urban non-slums were reported in Bangladesh.[41] Slum residents reported financial issues being the main reason for not taking prescribed drugs whereas getting better was the cited main reason for urban non-slum residents in Iran.[113] Better coverage of services and higher rates of treatment completion were reported for patients with tuberculosis in slums compared with non-slum urban setting in two studies in Brazil,[42 120] where a higher priority given to enhancing the Family Health system in socially less developed areas in recent years was suggested to be a likely factor associated with better service provision in slums.[120] (Table 4)

Table 4. Studies that examined factors associated with health care seeking and utilisation in both urban slum and non-slum urban and rural settings

| Study & location | Differences in healthcare access | Associated factors |
|---|---|---|
| Obanewa (2020)[52] | ***Fully-immunised child coverage (FIC)*** Proportion in slum lower than urban non-slum but higher than rural; proportions increased between 2003 and 2013 across all three settings | From multivariable regression*: year, birth order, antenatal attendance, maternal education level, religion, maternal age at child's birth, media exposure, region of the country, interaction between place of residence and place of delivery |
| Angeles (2019)[41] | ***Use of modern contraceptive methods*** Proportion changed from being lower in slums in 2006 to being higher in slums in 2013 compared with urban non-slums | From multivariable regression*: parity, mother's age, mother's education attainment, socioeconomic status, interaction (slum × time period) |
| | ***Delivery by skilled birth attendant*** Proportion substantially lower in slums compared with urban non-slums but the gaps narrowed over time) | From multivariable regression*: Residing in slums, parity, mother's age, mother's education attainment, length of stay in current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Islam (2018)[89] | ***Antenatal care visits*** "there was a large inequality" between slum and urban non-slum (detail not reported) | Level of educational attainment, wealth index of the household |
| | ***Using contraceptive methods*** "Prevalence rate higher among slum women" than urban non-slum women | Not reported |
| Tabrizi (2018)[113] | ***Utilisation of health services in the past 30 days*** Similar utilisation overall, but with lower proportion received needed health services and used private clinics, higher use of vaccination and maternal health services, and lower use of services for heart failure and hypertension for slum residents compared with urban non-slum | High cost of services |
| | ***Home care services*** Very little use both in slum and urban non-slum areas | High cost of services |
| | ***Prescribed drug during last visit to health facilities*** Lower proportion for slum vs urban non-slum | Not reported |
| | ***Not taking drugs prescribed*** Higher proportion for slum vs urban non-slum | Main reason: financial problems for slum vs getting better/feeling well for non-slum urban |

| | | |
|---|---|---|
| Snyder (2016)[42] | ***Directly observed treatment coverage for tuberculosis (TB)***<br>Higher for slum vs urban non-slum TB patients | Not examined |
| | ***Abandonment of TB treatment***<br>Lower for slum vs urban non-slum TB patients | From multivariable regression*: residency in a slum, sex, age, extrapulmonary clinical disease, HIV/AIDS, interaction (directly observed treatment x residency in a slum) |
| Prado Junior (2016)[120] | ***Coverage under Family Health system for TB patients***<br>Higher for slum vs urban non-slum | Giving the Family Health strategy priority to coverage of areas with lower social development |

*From the model with most comprehensive adjustment including residency in slum as one of the variables; only factors that were statistically significant (at 5% level) are shown. AIDS: Acquired Immune Deficiency Syndrome; HIV: human immunodeficiency virus; TB: tuberculosis.

# DISCUSSION

## Statement of principle findings

This scoping review of recent literature examined demand side factors associated with slum residents' healthcare seeking behaviour and healthcare utilisation, as well as supply side factors associated with provision of health services in slums. We found over 80 studies related to the former, but only eight studies related to the latter. We identified different factors associated with access and provision of health services in slums, and mapped them to a conceptual framework developed and refined for this review into seven broad categories (Figure 2).

## Findings in the context of existing literature

Even though previous reviews have investigated factors associated with healthcare access in various settings,[122] [123] to our best knowledge this scoping review is the first that has comprehensively examined relevant factors across different service areas of health care in slums. Our findings are consistent with previous studies which highlighted common factors

associated with healthcare seeking and utilisation such as age, income and education.[122 124] We identified several factors that are particularly pertinent in slum settings, such as costs of healthcare,[19 21 61 64 66 70 74 77 87 94-96] lack of time due to slum residents' competing priorities[21 87 98] and issues arising from adverse physical environment,[69 94 116 118] security,[86 118] fear of formal registration due to distrust of the authorities[118] and proximity of healthcare facilities.[21 64 68 70 73 79 93 105-107] In addition, included studies showed that the effects of a given factor may differ between slum, urban non-slum and rural settings.[52]

Healthcare cost is a major barrier between the intention to seek care and actual utilisation of services. [95 115] Health insurance is one of the key measures to overcome this barrier[125] but results from previous studies showed that uptake of public insurance among slum residents could be low.[39] To improve the access to healthcare services among slum residents, policies that improve the uptake and utilisation of health insurance as well as reducing healthcare costs for slum residents need to be considered.

Several studies reported lack of time and competing priorities as a factor affecting healthcare-seeking behaviour[87 97 98] and health services utilisation.[21 61 72] This suggests a delicate balance between factors that individual slum residents have to strike when making decisions on healthcare seeking and utilisation. Var der Heijden et al. showed that health was considered as an asset for working ability in slums,[97] but paradoxically the ability to work often seems to impede healthcare seeking for health issues. This highlights the importance of considering slum residents' interest and priorities when providing healthcare services and promoting healthcare utilisation in slums.

**Strengths and weaknesses of the review**

This scoping review has several strengths. We conducted a comprehensive literature search

using generic terms related to slums with few other restrictions. The search was therefore likely to be sensitive for identifying relevant literature. Contemporary methodological guidelines for undertaking scoping reviews were followed,[22] and a conceptual framework which was adapted based on emerging findings was used to facilitate the organisation of evidence.

The review has enabled theory building and refinement of a conceptual framework. Our preliminary framework included six categories (Figure 1). During data coding and extraction, it emerged that many studies reported perception, knowledge, and experience of slum residents being associated with their healthcare-seeking and utilisation. We subsequently classified these factors as cognitive and experiential factors, which primarily consists of three subcategories: knowledge/experience of illness, perceived needs for accessing healthcare services, and perception/experience of healthcare services. These factors were influenced by other factors included in our original conceptual framework, but highlighted the crucial links between those factors and the ultimate actions by individual slum residents to access health services. Future interventions to promote health service utilisation for slum residents[126] could make use of our framework to develop programme theories and map out causal pathways.

This review also has some limitations. Given time constraint, we were only able to examine the most recent literature published in English, and have not examined the methodological quality of individual studies (which we noted to be quite varied) in detail. We attempted some preliminary synthesis to configure the identified evidence but have not explored the complex relationship between the factors identified in depth. Nevertheless, findings from this scoping review will provide a good foundation for further syntheses.

## Methodological considerations

A challenge in the process of classifying and coding data is worth mentioning. Several

factors associated with healthcare seeking and utilisation can be viewed from different perspectives and therefore potentially be coded under different categories. For example, barriers for healthcare seeking and utilisation related to costs can be considered as socioeconomic issues from the slum dwellers' perspective but can also be viewed as health system issues for not offering the services in an affordable way. Indeed, previous access frameworks suggested that access is created and negotiated in a dynamic interchange between households/communities and healthcare workers/systems (i.e. demand and supply) on each access dimension.[29 127] In such situations, we tried to code a factor under the category that most directly reflects the original data through discussions within the review team (in the example of healthcare cost, the factor was coded primarily under socioeconomic factors rather than health system factors when the factor was reported by slum residents as a barrier); otherwise more than one category was coded (for example, bad experience from previous utilisation of health services was coded both as a cognitive and experiential factor and a health system factor).

**Implication for research and practice**

The multitude of factors identified in this review are often inter-related and inter-acting, and span across personal, family, community and society levels. For example, the association between occupation and healthcare utilisation were reported in several studies.[35 38 53 68 69 91] The effect of predominantly casual work undertaken by slum residents on their healthcare access could be mediated through working hours, income level, knowledge of health and available services, etc. There is also possibility that occupation was associated with health status and hence needs for healthcare services, instead of/in addition to behaviour of using healthcare services. Teasing out the complicated relationships between various determinants will require in-depth analysis and a more holistic approach to synthesising the evidence. Given the unique

features of individual slums, service planners and policy makers will need to examine these relationships with due consideration to the context specific to each locality and geospatial features and neighbourhood effects that characterise slum settings.[4]

We found far fewer studies that have examined health service providers' perspective than studies that have investigated factors associated with accessing healthcare from slum residents' perspective. There may be scope for greater research and policy attention to supply-side factors, including experiences and practices of local frontline healthcare providers, availability of healthcare facilities and infrastructure and policy to support them in order to overcome the many barriers highlighted from both supply and demand sides.

Although only six of the included studies explored factors associated with healthcare access or health service provision across slum and non-slum settings, they showed a generally encouraging picture that access to and provision of healthcare are continuously evolving (and often improving) in slums and other settings, and equality between different settings is not beyond reach.

## CONCLUSION

This scoping review summarises a large body of recent literature evaluating factors associated with seeking and utilisation of healthcare by slum residents, but found substantially fewer studies examining factors associated with provision of health services from providers' perspective. Recent migration into slums; knowledge, perception (including misconception and distrust) and past experience of illness, healthcare needs and health services; financial constraint, competing priorities and inadequacy of social support; adverse physical environment and unfavourable locality; sociocultural expectations and stigma; lack of official recognition; and various problems in existing health system all contribute towards the

challenges faced by slum residents. Future research and policy aiming at improving healthcare services in slums should pay more attention to supply side issues ranging from individual healthcare providers and practices to structural and policy level factors to tackle different barriers faced by slum residents, which in turn need to be evaluated holistically and take into account local context and geospatial features of slums.

**List of abbreviations**

GRADE: Grading of Recommendations Assessment, Development and Evaluation

LMICs: Low and Middle income Countries

MMAT: Mixed Methods Appraisal Tool

WHO: World Health Organization

**Ethics approval**

Not applicable. This realist synthesis included literature that is available in the public domain and did not involve the collection of personal data.

**Consent for publication**

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**Availability of data and materials**

All data relevant to the study were included in the article or uploaded as supplementary information. No additional data were available.

**Competing interests**

The authors declare that they have no competing interest.

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**Contributor**

JEP, BH, MA, FG and YFC conceptualised the scoping review; JEP carried out literature searches; JEP, PK, GY, OO, and YFC participated in study screening and coding; JEP and YFC performed data charting and drafted in initial manuscript. NA, PG and RL provided critical input during the drafting of the manuscript. All authors commented on and contributed to the revision of subsequent versions and approved the final version for submission.

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**Figure legends.**

Figure 1. Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

Figure 2. Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

Figure 3. Flowchart

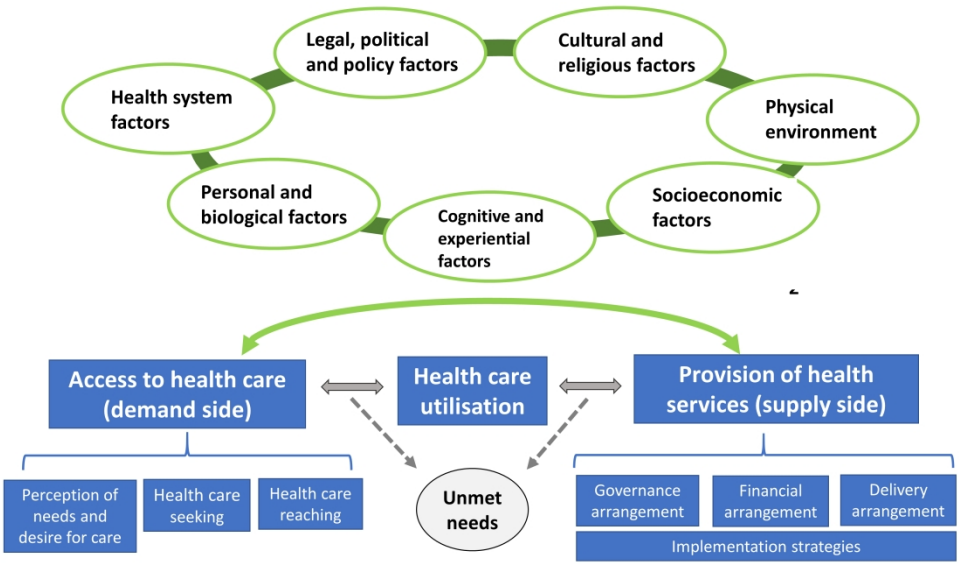


Figure 1. Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

338x190mm (300 x 300 DPI)

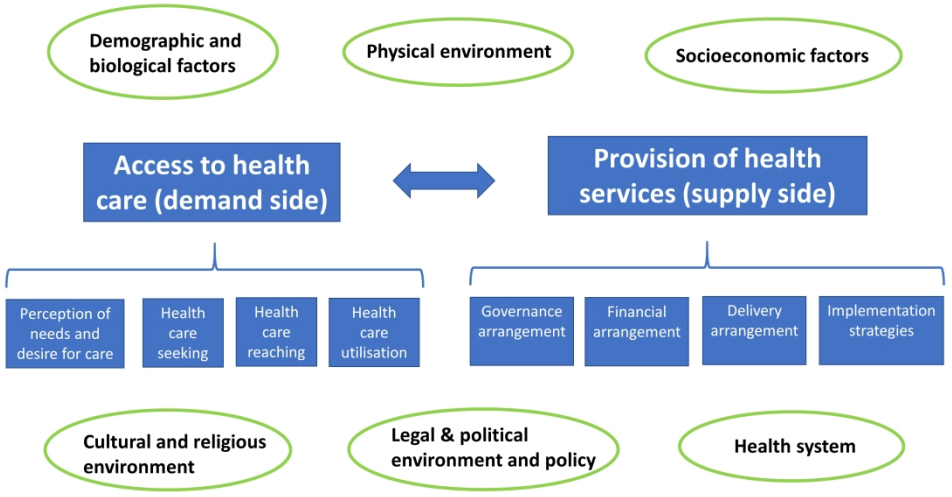


Figure 2. Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

338x190mm (300 x 300 DPI)

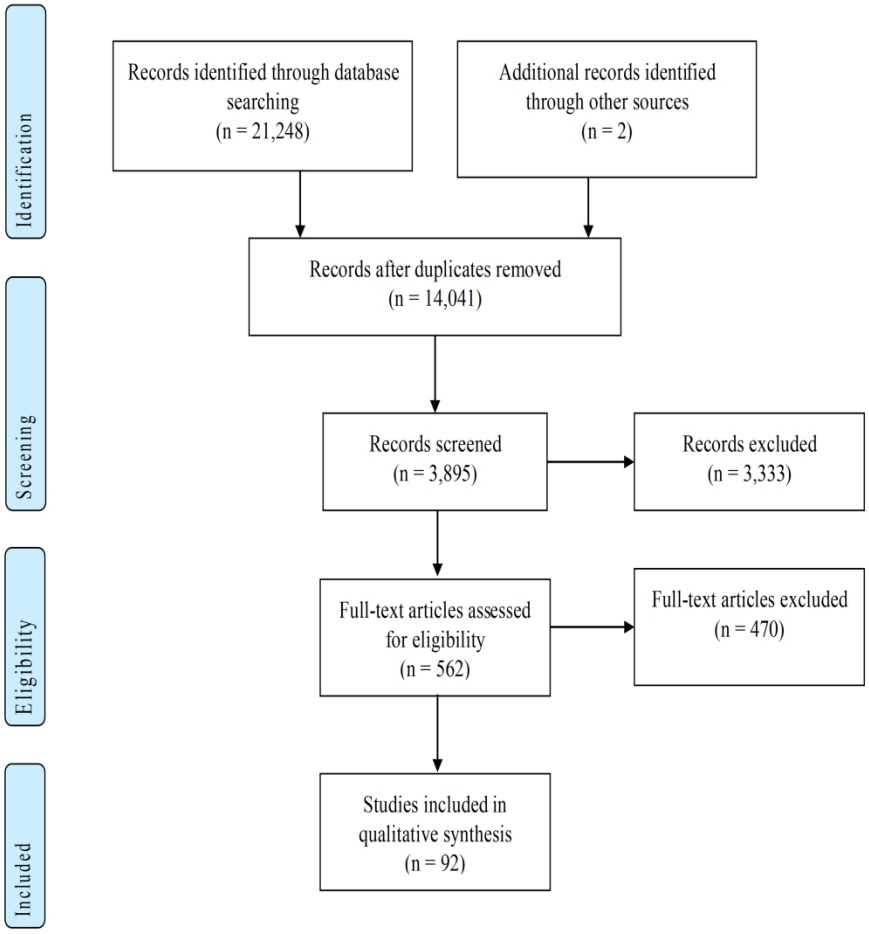


Figure 3. Flowchart

338x451mm (300 x 300 DPI)

Supplemental Table 1. Healthcare-seeking behaviours of slum residents reported by included studies and associated factors.

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest for this review |
|---|---|---|---|---|---|---|---|
| General healthcare seeking behaviour | Gaiha (2020)[98] | Hetero-couples in slums | India | Cross-sectional study | Mixed method | Ability to attend any health promotion activity | Lack of time related to work as a reason for low male participation |
| | van der Heijden (2019)[97] | Female workers and key informants in slums | Bangladeshi | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Competing interest (ability to work and income) |
| | Aleemi (2018)[90] | Slum residents | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Household income; government facility; NGO facility |
| | Wekesah (2019)[115] | Slum residents | Kenya | Cross-sectional study | Qualitative | Care-seeking and adherence to treatment for CVD | Cost of healthcare; lack of healthcare facilities |
| | Kar (2017)[50] | Slum residents | India | Cross-sectional study | Quantitative | Undiagnosed hypertension | Sex; poverty; unskilled laborer; literacy |
| | Mistry (2016)[58] | TB patients in slums | India | Retrospective study | Quantitative | Delays in care seeking | Perception of symptoms; home remedies; not want to miss work; provider shopping; delay in advising TB-relevant tests; referral. |
| | Kulkarni (2016)[43] | Women in slums | India | Cross-sectional study | Quantitative | Participation in breast cancer screening | Age; education; religion; Mother tongue; occupation; marital status; tobacco habits; family history of cancer; history of cancer screening |
| | Misra (2017)[87] | Slum households | India | Cross-sectional study | Quantitative | Health-seeking practice for cataract | Lack of time, fear of surgery, financial difficulties |
| | Ramagiri (2020)[64] | Slum residents with diabetes | India | Case control study | Mixed-method | Uptake of diabetic retinopathy screening | Realization of consequences of disease; travel assistance and proximity of the screening facility; absence of an accompanying person; cost |
| Healthcare for | Lungu | Caregivers of | Malawi | Cross- | Quantitative | Healthcare-seeking | Age; education; illness was |

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| children | (2020)[44] | children under 5 years of age in slums | | Cross-sectional study | | behaviour | perceived to be severe; fever; home management of childhood illness |
| | | | | | | Timely healthcare seeking behaviour | Home management of childhood; knowledge of caregivers about child danger signs |
| | McNairy (2019)[19] | Slum households with children ≤ 5 years old | Haiti | Cross-sectional study | Quantitative | Healthcare access | Inability to afford care |
| | Hutain (2019)[86] | Caregiver at the time of the child's death in slums | Sierra Leone | Cross-sectional study | Mixed-method | Health care-seeking | Use of traditional medicine; difficultly reaching the health facility; doubts about need for medical care; mistreatment by staff |
| | Kerai (2019)[45] | Caregiver of children aged 2 months to 5 years in slums | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Age of child; gender of child; income; education of caretaker; vaccine awareness; breastfeeding awareness; presence of symptoms such as fever, tachypnea, chest indrawing, persistent vomiting, recurrent illness. |
| | Lungu (2018)[95] | Caregivers of children under 5 years of age in slums | Malawi | Prospective study | Quantitative | Healthcare-seeking behaviour | Cost; waiting time; availability of medicines and supplies; attitude of health workers; thorough examination of the child |
| | | | | | | Willingness to pay for the health facility | Waiting time; availability of medicine and equipment; superficial or thorough examination; attitude of health workers |
| | Kamati (2019)[60] | Slum residents | Namibia | Cross-sectional study | Mixed-method | Self-medication | Perceived diagnosis as "minor or mild"; waiting times and queues to receive care |
| | Mishra (2017)[56] | Mothers living in slums with a child and | India | Cross-sectional study | Quantitative | Healthcare seeking behaviour | Symptoms and severity |

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| | | migrated recently | | | | | |
| | Lungu (2016)[70] | Caregivers and health providers in slums | Malawi | Longitudinal study | Qualitative | Healthcare-seeking behaviour | Home management; lack of medicines and supplies; waiting times; facility opening times; attitude of health workers; suboptimal examination of the sick child; distance to health facility; cost of healthcare |
| Healthcare for women | Muralidharan (2019)[105] | Girls and mothers in slums | India | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Proximity of healthcare facilities |
| | Nasrin (2019)[96] | Married women with a child in slums | Bangladesh | Cross-sectional study | Mixed-method | Healthcare-seeking behaviours | Inability to spend the treatment cost |
| | Jayaweera (2018)[66] | Girls and women in slums | Kenya | Cross-sectional study | Qualitative | Access to contraception and abortion in healthcare facilities | Stigma; lack of education about safe methods of abortion; perceived illegality of abortion; limited access to services because of financial barrier; fear of mistreatment and mistrust of health providers/facilities; geographical proximity |
| | Williams (2018)[109] | Mothers and medical personnel in slums | Bangladesh | Cross-sectional study | Qualitative | Mental healthcare seeking | Culture and stigma |
| | Ilankoo (2018)[65] | Women in slums | Sri Lanka | Cross-sectional study | Qualitative | Health-seeking behaviours related to vaginal discharge | Confusion in differentiating normal from abnormal vaginal discharge; effects on day-to-day life; confusion toward the causative factors; difficulties in disclosing; neglecting behaviours; and socio-cultural influences toward health-seeking behaviours. |
| | Athie (2017)[110] | Anxious and depressed women in | Brazil | Cross-sectional study | Qualitative | Healthcare seeking behaviour | High medical turnover and overload of healthcare providers |

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| | | slums | | | | | |
| | Sudhinaraset (2016)[77] | Mothers and their families in slums | India | Cross-sectional study | Qualitative | Maternal health services and delivery experiences | Financial barriers; disrespectful care |
| | Pune Municipal corporation[33] | Recently delivered slum residents | India | Cross-sectional study | Mixed-method | Seeking front-line worker during labor | No time to call; family did not allow; being out of town; lack of trust; delivery at night |
| | | | | | | Going to the Referred Place for Pregnancy Complications | Not necessary; family did not allow; lack of trust/poor quality services; don't like going to a difference facility; too far; cost; no transportation; private hospital |
| Preference for healthcare providers | Das (2018)[88] | Slum residents | India | Cross-sectional study | Qualitative | Healthcare-seeking practice (preference for formal/informal healthcare) | Female prefer informal healers (cultural competency of care, easy communication, gender-induced affordability, avoidance of social stigma and labelling, living with the burden of cultural expectations and geographical and cognitive distance of formal health care) |
| | | | | | | | Male prefer formal care (ease of access, quality of treatment, expected outcome of therapies) |
| | Angeli (2018)[100] | Slum residents | India | Cross-sectional study | Mixed-method | Choice between public or private hospital | Bottom-of-the pyramid patients visit a public hospital more than top-of-the-pyramid patients |
| HIV testing | Thomson (2018)[59] | Stakeholder including residents and healthcare service provider | Kenya | Cross-sectional study | Qualitative | HIV testing | Denial; complacency; fear of death; anticipation of unbearable stress; felt ill; had a partner die; learned that their partner was HIV-positive. |
| Expenditure | Mishra (2017)[49] | Slum households with a child aged 0–14 | India | Cross-sectional study | Quantitative | Treatment-seeking behaviour | Child's gender |

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| | years and who had migrated within the last 12 years | | |

CVD: cardiovascular disease; HIV: human immunodeficiency virus; NGO: non-governmental organization; TB: tuberculosis.

Supplemental Table 2. Healthcare utilisation of slum residents reported by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest for this review |
|---|---|---|---|---|---|---|---|
| General utilisation | Agrawal (2019)[101] | Older adults in slums | India | Cross-sectional study | Quantitative | Utilisation of welfare schemes | Religion; Caste; education; |
| | Ahmed (2019)[108] | N/A | Bangladesh | Cross-sectional study | Quantitative | Access to, and availability of healthcare services | Variability in traffic congestion |
| | Madan (2019)[83] | Female slum residents | India | Cross-sectional study | Qualitative | Access to primary care | Long waiting times and opening times of the primary health care; quality of services; satisfaction with treatments; home remedies; cost; rude attitude of healthcare providers |
| | Owiti (2018)[73] | Pregnant women in slums | Kenya | Cross-sectional study | Quantitative | Utilisation of maternal health services in public health facilities | Perception about public health facility delivery; living within close proximity; waiting time at the facility; learning about the program; quality of service; ANC attendance at a private and a non-profit health facility |
| | Castiglione (2018)[74] | Slum residents | Brazil | Cross-sectional study | Qualitative | Barrier to healthcare services | *Public healthcare services:* structural aspects of the healthcare system in their community as a whole, such as scarcity of personnel and equipment, or long waiting periods; experiences of conflict when dealing with doctors and other professionals of the public healthcare system |

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| | | | | | | *Private healthcare services*: Insufficient funds to seek assistance; services or products in the private sector; |
| Tabrizi* (2018)[113] | Households in slum and non-slums | Iran | Cross-sectional study | Quantitative | Utilisation of health services | High cost of services |
| | | | | | Home care services | High cost of services |
| | | | | | Not taking drugs prescribed | Slums: financial problems<br><br>Non-slums: getting better/feeling well |
| Wairiuko (2017)[75] | Elderly in slums | Kenya | Cross-sectional study | Mixed-method | Health service utilization | Family support; satisfaction with healthcare services; gender healthcare worker preference; services by community health worker |
| Owusu-Ansah (2016)[69] | Slum residents | Ghana | Cross-sectional study | Qualitative | Utilization of healthcare | Education; occupation; NHIS membership; knowledge of symptom; overall knowledge score; transportation |
| Adane (2017)[68] | Mothers/caregivers of under-five children in slums | Ethiopia | Cross-sectional study | Quantitative | Utilization of healthcare facilities in children with diarrhoea | Mothers/caregivers education; occupation; time of walking to the nearest health facility; household monthly income; recognized danger signs |
| MacPherson (2019)[106] | Slum residents | Malawi | Prospective study | Quantitative | Access to TB diagnosis | Distance to the nearest TB registration clinic |
| Wingfield | Slum households | Peru | Randomized | Quantitative | Initiation of TB | Socioeconomic support and |

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| (2017)[99] | with patients treated for TB | | controlled study | | preventive therapy | social support |
| Iberico (2016)[85] | Healthcare workers and community members in slums | Peru | Cross-sectional study | Qualitative | Utilization of TB preventive therapy | Misunderstanding and fear of treatment |
| Snyder* (2016)[42] | TB patients living in slum and non-slum | Brazil | Retrospective study | Quantitative | Abandonment of treatment | Residency in a slum; sex; age; extrapulmonary clinical disease; HIV/AIDS; interaction (directly observed treatment × residency in a slum) |
| Oluoch (2017)[82] | Slum residents | Nairobi | Cross-sectional study | Quantitative | Attendance to HIV testing and counselling services | Previous test experience |
| Martinez Perez (2016)[76] | Healthcare workers and community members in slums | South Africa | Cross-sectional study | Mixed method | HIV Counselling and Testing | Fear; lack of trust |
| Amiresmaili (2019)[18] | Slum residents | India | Cross-sectional study | Quantitative | Utilisation of outpatients services | Gender; marital status |
| | | | | | Utilisation of inpatients services | Age of household head; marital status; insurance |
| Horng (2019)[38] | Slum households with children under 5 years old who either recently relocated <12 months or who were residentially stable living >24 months | Bangladesh | Cross-sectional study | Quantitative | Healthcare utilisation in severe acute respiratory illness | Relocation; age of child; education of mother; household wealth; health service knowledge |
| | | | | | Full vaccination coverage | Relocation; number of children in household; age of child; education of mother; occupation of household head; household wealth; health service knowledge |
| Kuria (2018)[111] | Patients received hypertension treatment in slums | Kenya | Retrospective study | Quantitative | Compliance with hypertensive treatment | Health facility group than walkway or weekend clinic attenders |

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| | Cernauskas (2018)[79] | Slum residents | India | Cross-sectional study | Quantitative | Health provide choice | Distance to health facilities; friendly attitude of healthcare workers; appropriate service; familiarity |
| | Kaba (2020)[61] | Stakeholders (community members, community opinion leaders, health professionals, health office representatives.) | Ethiopia | Cross-sectional study | Qualitative | Utilisation of h services | Individual level: awareness about health problems; competing priorities; capacity to pay for services when referred. |
| | Mataboge (2016)[112] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Healthcare utili | Long waiting time |
| Immunization | Obanewa (2020)[52] | Rural/urban formal/slum residents | Nigeria | Retrospective cross-sectional study | Quantitative | Fully-immunized child coverage | For slums: delivery place; maternal education; birth order; antenatal attendance; religion<br><br>For slum and non-slums: year; birth order; antenatal attendance; maternal education; religion; maternal age at child's birth; media exposure; region of the country; interaction between place of residence and place of delivery |
| | Viramgami (2019)[104] | Married slum residents in | India | Cross-sectional | Quantitative | Vaccination status child | Mother's employment |

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|---|---|---|---|---|---|---|
| | reproductive age | | study | | | |
| Singh (2018)[36] | N/A | India | Literature review | - | Childhood vaccination | Fear of adverse events; lack of information/knowledge; disease not harmful/serious; parents busy; income; mother's education; travel/transfer/migration; unawareness of need for health services; faith in immunization; mother ill; forgetfulness; lack of initiative; family problems; services not available/lack of facility; shortages/reluctant to open 10 dose vials for 1 or 2 infants; current/history of sickness lead to withhold the vaccine |
| Pugliese-Garcia (2018)[63] | Stakeholders including slum residents, healthcare workers, health committee members, vaccinators | Zambia | Cross-sectional study | Qualitative | Vaccine hesitancy | Traditional remedies; alcohol use; religious beliefs; distrust towards western medicine; previous adverse events; fear of injections and low perceived need for immunisation; limited understanding of how vaccines work; overlapping local terms for vaccine; pain; perceived risk of infection |
| Manandhar (2018)[80] | Slum household with children age of 12-60 months | Nepal | Cross-sectional study | Quantitative | Incomplete immunization | Knowledge on immunisation schedule |
| Dasgupta (2018)[102] | Slum household with children aged | India | Cross-sectional | Quantitative | Vaccine hesitancy | Family type; education of mother |

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|---|---|---|---|---|---|---|
| | 0-59 months, resides in the study area for the past 12 months | | study | | | |
| Lae (2018)[37] | Caregivers in slums | Myanmar | Cross-sectional study | Qualitative | Utilisation of immunisation services | Age of child; income; migration; antenatal visit; receiving additional vaccines before; Having immunisation card. |
| Schultz (2017)[107] | Parents with children <5 years old in slums | Kenya | Prospective study | Quantitative | Timeliness of vaccination | Close to the clinic; birth in December |
| Crocker-Buque (2017)[21] | People living in a low-income urban area or slum in a low-middle income countries | Multiple nations | Systematic review | - | Immunisation coverage | *Socioeconomic and demographic characteristics:* socioeconomic status; wealth; parents' literacy; mother's education; employment; residential status; place of residence; place of delivery; household visit by health workers; premature birth; malnourishment; inadequate housing; poor prenatal care; ethnicity; age; maternal age; birth order; sex of child; number of children<br><br>*Migration status:* migration; recent migration<br><br>*Information, beliefs and behaviour:* unaware of the need for vaccines; unaware of clinic location or timing; maternal knowledge of |

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| | | | | | | | immunization; lack of access to information; parents being too busy; return to home village; difficulty in accessing services; fear of side effects; attitude of health workers; concerns over cost; being suspicious of free services<br><br>*Health services:*<br>distance from health centre; timing of services; fear of costs; risk of lost income; lack of local knowledge; patients' satisfaction; provision of accurate information; accessing pre-natal care |
| | Shrestha (2016)[47] | Slum households with children aged 12–23 months. | Nepal | Case-control study | Quantitative | Incompletion of immunisation | Age; birth order; home delivery; education; ethnicity; type of residence; socioeconomic status; knowledge of primary care-taker |
| | Devasenapathy (2016)[51] | Slum household with children aged between 12 and 42 months | India | Cross-sectional study | Quantitative | Childhood complete immunisation | Sex; mother's literacy; place of birth; place of childbirth; religion; socioeconomic position; birth certificate |
| Maternal | Razzaque (2020)[34] | Slum residents | Bangladeshi | Cross-sectional study | Quantitative | Healthcare utilisation | Recent migration; wealth; education; employment |
| | Getachew (2020)[71] | Slum households | Ethiopia | Cross-sectional study | Quantitative | Delivery in healthcare facilities | Perceived as not customary to deliver at health facility; not necessary; unavailability of female birth attendants; perceived |

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|---|---|---|---|---|---|---|
| | | | | | | quality of services; cost |
| Shrestha (2019)[53] | Mothers with infant residing in slums | Nepal | Cross-sectional study | Quantitative | Utilisation of antenatal and delivery services | Educational status of respondents and their husbands; number of pregnancy |
| | | | | | Institutional delivery | Educational status; occupation of husband; number of pregnancy |
| | | | | | Postnatal visit | Occupation of husband |
| | | | | | Utilisation of family planning services | Occupation of husband |
| | | | | | Tetanus Toxoid immunisation | Educational status of respondents; economic status; knowledge about healthcare services; educational status of husband; number of pregnancies |
| Atusiimire (2019)[84] | Mothers delivered in the past one year in slums | Uganda | Cross-sectional study | Quantitative | Facility based deliveries | Exposure to media concerning facility delivery; frequency of ANC; timing of 1st ANC |
| Upadhyai (2019)[40] | Recently delivered mothers residing in slums | India | Cross-sectional study | Quantitative | Healthcare utilisation | Age; education of mother and father; socioeconomic class; antenatal check-ups; institutional delivery services; family type; caesarean delivery; complication or perceived health problem |
| Angeles* (2019)[41] | Slum and non-slum residents | Bangladesh | Prospective study | Quantitative | Use of modern contraceptive methods | Parity, mother's age; mother's education, socioeconomic status, interaction (slum × time period) |
| | | | | | Delivery by skilled birth attendant | Residing in slums, parity, mother's age, mother's education, length of stay in |

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|---|---|---|---|---|---|---|
| | | | | | | current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Kusuma (2018)[67] | Recent migrant and settled mothers with a child up to the age of 1 year in slums | India | Cross-sectional study | Quantitative | Birth in health facility | Listening to radio; number of ANC visits; plan for hospital birth; plan for transport; some danger sign; knowledge of danger sign |
| Sharma (2018)[114] | Women living in urban slums and delivered a baby within 1 year | India | Cross-sectional study | Quantitative | Utilisation of maternal care services | Mode of delivery; hospital stay after delivery |
| Islam* (2018)[89] | Ever-married women aged 15-49 years living in slum and non-slum | Bangladesh | Cross-sectional study | Quantitative | ANC visits | Education; wealth index of the household |
| Geddam (2017)[35] | Rural to urban internal migrant mothers with a child of less than 2 years of age | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education of the mother; family size; occupation of mother |
| | | | | | Delivery in institution | Educational status of mother; number of ANC visit; adequacy of ANC; migration status |
| Kaba (2017)[72] | Stakeholders including city administrators, community members, healthcare providers | Ethiopia | Cross-sectional study | Qualitative | Maternal health service utilisation | Lack of awareness and lack of perceived needs about available services; fear of stigma; competing priorities, social connectedness; perceived lack of respectful service providers; socio-cultural factors including socially sanctioned expectations |
| Verma | Pregnant | India | Case-control | Mixed- | Antenatal care | Knowledge of healthcare |

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| | (2017)[62] | women and infants in slums | | study | method | registration/immunisation | services; perceived need for healthcare services; family support; fear; negative experience with previous vaccination |
| | Sharma (2016)[48] | Married women in slums | Nepal | Cross-sectional study | Quantitative | Antenatal health utilisation | Age; husband education; spouse occupation; family income; type of family; planned pregnancy; death of children |
| | Jolly (2016)[92] | Married women with a pregnancy outcome in the previous year in slums | Bangladesh | Cross-sectional study | Quantitative | Antenatal care; births assisted by medically trained provider; postnatal care; treatment seeking for delivery complications | Education; wealth |
| | | | | | | Use of modern family planning | Wealth |
| | Tebekaw (2016)[103] | Women in slums | Ethiopia | Cross-sectional study | Quantitative | Antenatal care services | Education; private/public hospital |
| | Sadhna (2016)[93] | Married women in slums | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education; Caste; wealth; distance to preferred health facility |
| | Neyaz (2016)[54] | Married women in slums | India | Cross-sectional study | Quantitative | Delivery in hospitals | Received ANC; number of ANC visits; education; birth order; living index |
| | Rahman (2016)[91] | Married women in rural and slum area | India | Cross-sectional study | Quantitative | Intrauterine contraceptive device utilisation | Income; occupation |
| | Sheehy (2016)[94] | Informant and women in slums | Myanmar | Cross-sectional study | Qualitative | Giving birth in hospital | Financial constraints; lack of transportation; sociocultural and financial considerations |
| Contraceptive | Renzaho (2017)[46] | Slum residents aged 13-24 | Uganda | Cross-sectional study | Quantitative | Access to contraceptive services and family planning | Age; disability |
| | Abd El Fatah | Married women | Egypt | Cross- | Quantitative | Contraceptive use | Number of male children |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | (2019)[55] | aged 15–49 years in slums | | sectional study | | | |
| Health insurance | Otieno (2019)[78] | Slum residents | Kenya | Cross-sectional study | Quantitative | Enrolment in a health insurance programme | Employment; source of primary care; satisfaction with cost of care; satisfaction with procedure of care; perceived health status |
| | Kusuma (2018)[39] | Slum residents | India | Cross-sectional study | Quantitative | Health insurance possession | Residential background (old slums than new); migration period; possession of ration card; household size; occupation of household head |
| | Gupta (2017)[81] | Slum households having health insurance cards | India | Cross-sectional study | Mixed-method | Utilisation of healthcare insurance | Awareness of the empanelled hospitals; experiences of friends and relatives at national health insurance empanelled hospitals; hospitals refused to accept health insurance cards |
| Expenditure | Sahu (2017)[57] | Women delivered within a period of 6 weeks in slums | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure for maternal and neonatal health services | Gravidity; type of delivery; place of delivery; morbidity |
| | Mishra (2017)[49] | Slum households with a child aged 0–14 years and who had migrated within the last 12 years | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure | Child's gender; mother's education; type of illness |

*Factors reported in the study were associated with participants covering both slum and non-slum residents. ANC: antenatal care; CVD: cardiovascular disease; HIV: human immunodeficiency virus; N/A: not applicable; NGO: non-governmental organization; TB: tuberculosis.

Supplemental Table 3. Provision of healthcare services in slums examined by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General provision | Kaba (2020)[61] | Stakeholders (community members, community opinion leaders, Urban Health Extension Professionals, and city health office representatives.) | Ethiopia | Cross-sectional study | Qualitative | Provision of healthcare services | Institutional-level: medical supplies; a lack of passion; attitudes on the part of health service providers<br><br>Community level: shared understanding of the problems; services and the community's established values in relation to the problems and services. |
| | Das Gupta (2020)[119] | N/A | India | Case study | Mixed-method | Improving public health services | Devolution of service delivery transferring funds and responsibilities to elected local bodies; management by professional managerial and technical cadres; Tight organisation of public health services; Professional support from the state directorate of public health |
| | Ongarora (2019)[121] | Private healthcare facilities | Kenya | Cross-sectional study | Quantitative | Provision of medicine | Medicine price, affordability and availability of medicine |
| | Agonigi (2018)[118] | Health professionals | Brazil | Cross-sectional study | Qualitative | Production of care in the daily work of health professionals | Issues related to assignment of tasks; inadequate space and equipment; requirement to follow standardised protocol; demands from the management; workload; environment (sanitation, territory); violence; registration |

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|---|---|---|---|---|---|---|---|
| | Odhiambo (2016)[116] | Community health workers | Kenya | Longitudinal study | Quantitative | Drug administration activities for schistosomiasis | Community health worker familiarity with households led to warm reception; good knowledge of intervention area by community health workers; high demand for drugs in the final year of treatment; effective community mobilization; opportunity to integrate mass drug administration with other health interventions; presence of community health workers and their supervisory structure, and points of referral for serious side effects; fear of side effects, size of tablet and misconceptions regarding treatment; unrelated death and the associated negative publicity by the media; religious beliefs and mistrust of interventions; insufficient time; absence of community members during the drug administration exercise; difficulty in directly observing treatment; unsanitary environmental conditions; inaccessibility (filthy and bush environment); demand for incentives by community members to take drugs. |
| | Patil (2016)[117] | Healthcare service centres | India | Cross-sectional study | Quantitative | Services provided under Integrated Child | Lack of basic infrastructural facilities; absence of essential drugs, equipment and |

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| | | | | | Development Services | logistics; poor pay scale, untimely drug supply, poor community support, more of documentation work, increased work burden, lack of supportive staff and no incentives for the increased work |
| | Mataboge (2016)[112] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Provision of reproductive health services | Healthcare policies; work overload; community-based care |
| | Prado Junior (2016)[120] | New TB cases living in slum and non-slum | Brazil | Cross-sectional study | Quantitative | Coverage under Family health system in TB patients | Policy prioritizing low social development areas |

TB: tuberculosis

## Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| **TITLE** | | | |
| Title | 1 | Identify the report as a scoping review. | 1 |
| **ABSTRACT** | | | |
| Structured summary | 2 | Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives. | 2 |
| **INTRODUCTION** | | | |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach. | 4 |
| Objectives | 4 | Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives. | 5 |
| **METHODS** | | | |
| Protocol and registration | 5 | Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number. | 5 |
| Eligibility criteria | 6 | Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale. | 6-7 |
| Information sources* | 7 | Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed. | 5-6 |
| Search | 8 | Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated. | 5, Supplement 3 |
| Selection of sources of evidence† | 9 | State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review. | 5-6 |
| Data charting process‡ | 10 | Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators. | 6 |
| Data items | 11 | List and define all variables for which data were sought and any assumptions and simplifications made. | 7-9 |
| Critical appraisal of individual sources of evidence§ | 12 | If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate). | N/A |

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| Synthesis of results | 13 | Describe the methods of handling and summarizing the data that were charted. | 7-9 |
| **RESULTS** | | | |
| Selection of sources of evidence | 14 | Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram. | 9, Figure 1 |
| Characteristics of sources of evidence | 15 | For each source of evidence, present characteristics for which data were charted and provide the citations. | Supplement 1-2 |
| Critical appraisal within sources of evidence | 16 | If done, present data on critical appraisal of included sources of evidence (see item 12). | N/A |
| Results of individual sources of evidence | 17 | For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives. | Table 2-3 |
| Synthesis of results | 18 | Summarize and/or present the charting results as they relate to the review questions and objectives. | Figure 2 |
| **DISCUSSION** | | | |
| Summary of evidence | 19 | Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups. | 25-26 |
| Limitations | 20 | Discuss the limitations of the scoping review process. | 27 |
| Conclusions | 21 | Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps. | 29 |
| **FUNDING** | | | |
| Funding | 22 | Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review. | 31 |

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

*From:* Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

BMJ Open

# Factors associated with accessing and utilisation of health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature

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# Factors associated with accessing and utilisation of health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature

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## ABSTRACT

**Objective**: To identify factors associated with accessing and utilisation of healthcare and provision of health services in slums.

**Design:** A scoping review incorporating a conceptual framework **for configuring reported factors.**

**Data sources:** MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library were searched **from their inception to December 2021** using slum related terms.

**Eligibility criteria:** Empirical studies of all designs reporting relevant factors in slums in low and middle income countries.

**Data extraction and synthesis:** Studies were categorised and data were charted according **to** a preliminary conceptual framework refined by emerging findings. Results were tabulated and narratively summarised.

**Results:** Of the **15,091** records retrieved from all years, **4,368** records dated between **2016-2021** were screened by two independent reviewers and **111** studies were included. The majority (**63 studies, 57%)** were conducted in Asia, predominantly in India. In total **104** studies examined healthcare access and utilisation from slum residents' perspective while only **ten** studies explored provision of health services from providers/planners' perspective (**three** study included both). A multitude of factors are associated with accessing, utilising and providing healthcare in slums, including recent migration to slums; knowledge, perception and past experience of illness, healthcare needs and health services; financial constraint and competing priorities between health and making a living; lacking social support; unfavourable physical environment and locality; sociocultural expectations and stigma; lack of official recognition; and problems in existing health system.

**Conclusion:** The scoping review identified a significant body of recent literature reporting

factors associated with accessing, utilisation and provision of healthcare services in slums. We classified the diverse factors under seven broad categories. The findings can inform a holistic approach to improving health services in slums by tackling barriers at different levels, taking into account local context and geospatial features of individual slums.

**Systematic review registration:** Open Science Framework (OSF, https://osf.io/694t2)

**Keywords:** slum, informal settlement, scoping review, healthcare-seeking behaviour, healthcare utilisation, health service delivery

Strengths and limitations of this study

- We conducted literature search in multiple databases using generic terms related to slums to ensure that a wide range of relevant studies was captured.
- A conceptual framework explaining factors associated with accessing and utilisation of healthcare by slum residents as well as provision of healthcare in slums was developed and used to categorise identified studies and factors.
- We examined barriers and facilitators of accessing healthcare and service provision from the perspectives of both demand side (slum residents) and supply side (healthcare providers and service planners).
- Only studies published **in academic journals** between **2016 and 2021** in English language were included, and methodological quality of each included study was not examined because of time constraint.
- We did not explore the complex relationships and interactions between various factors **in different contexts** at different slum locations, but our mapping of these factors to the conceptual framework should facilitate further in-depth analyses.

# INTRODUCTION

Rapid urbanisation has resulted in a growing number of residents in slums[1] who face ongoing problems such as unemployment, poor sanitation, lack of transport, high level of crime, and haphazard development.[2] In 2018, over one billion people were living in slum-like conditions, and Central, South and South-East Asia and Sub-Saharan Africa accounted for 80% of them.[1] Even though various definitions of slums exist, there is no universally agreed definition of what constitutes 'a slum', and the term itself is widely debated and contested.[3 4] For the purpose of this scoping review, we refer to slums as densely populated areas characterised by lack of basic services, substandard housing, overcrowding, unhealthy living condition, insecure tenure and poverty,[4 5] taking into account the crucial concepts of place and space that are important in shaping health outcomes and community access to health services in these urban settings.[4]

Previous studies have reported various risk factors affecting health of slum residents such as physical environment,[6] sanitation,[7] social capital[8 9] and water governance,[10] and have observed in some cases that slum residents have worse health status compared to non-slum urban and/or rural residents. For example, Ezeh et al. found that children living in slums had higher mortality than rural and non-slum urban populations.[3] Poorer height-for-age for children[11] and higher prevalence of childhood illnesses and malnutrition[12] have also been observed in slums compared to non-slum urban and rural settings. In addition, slum residents are susceptible to unhealthy behaviours.[13 14] Living in slums has been found to be associated with low physical activity,[13] poor diet,[14] and poor knowledge about the cause and preventability of diseases.[15]

Despite the unfavourable health status and environment, and consequently the potential high level of healthcare needs, previous studies showed that slum residents were less likely to seek and use healthcare services than their non-slum counterparts in the cities.[16 17] Slum residents have been found to have lower rates of healthcare utilisation in antenatal services[16] and services

for non-communicable diseases[17] compared to residents of urban 'formal' settings. One study in Iran showed that only about half of slum households that required outpatient services could use them.[18] Another study in Haiti also reported that one third of slum households were not able to access medical care for their children when it was needed in the past year.[19]

While the health status and needs of slum residents have been described in previous reviews,[3] [20] factors associated with healthcare seeking behaviour and healthcare utilisation of slum residents and factors related to the provision of health services in slums have not been systematically examined (with the exception of immunisation services).[21] This scoping review aims to fill in these evidence gaps and inform efforts to improve healthcare delivery to people in slums.

## METHODS

This scoping review was performed according to current best practice guidance.[22] The broad question of interest was: "*What factors are associated with slum residents' **accessing and utilisation** of health care and/or the provision of health services in slum settings in low and middle income countries (LMICs)*?" The protocol for this review was registered in Open Science Framework (OSF).[23]

### Literature search and study selection

A broad search of five databases (MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library) was conducted in April 2020 **and updated in December 2021**. Searches were limited to English language. Key terms related to slums were used: slum or slums or

ghetto or ghettos or informal settlement$ or shantytown$ or shanty town$ or favela$. **(Appendix 1)** We did not include terms related to other concepts in order to maximise the sensitivity of our searches. **In addition, we searched organizational websites of Slum Dwellers International, UN HABITAT, UN and WHO but did not identify relevant studies.**[24-27]

Records retrieved from databases (after duplicates were removed) were initially screened by one reviewer (JEP) and those which did not meet the inclusion criteria were disregarded. After that, a second reviewer (PK, GY, OO) examined the remaining records independently based on titles and abstracts. When the decisions of two reviewers differed, the discrepancy was resolved based on full-texts and/or by discussion with a third reviewer (YFC) or the broader review team. This study screening process started from records of the most recent years (i.e. in the past three years) and then proceeded to prior years. Due to the larger than expected volume of the literature, we eventually screened records **between 2016 to 2021** and did not cover earlier records in order to synthesise and present the findings from latest evidence in a timely fashion to inform the wider project hosting this review.[28 29]

**Inclusion and exclusion criteria**

A study was included when it: (1) described factors related to slum residents' accessing or utilisation of health care or the provision of health services in slums; and (2) was conducted in relation to slums in LMICs. Only articles written in English were included. A study was excluded when it was a commentary, opinion, or narrative review; described slum residents' utilisation of health services or the provision of health services without exploring the associated factors; investigated informal care at home; or included mixed slum and non-slum populations without separately reporting data for slum residents or investigating residency in slums as a

factor for healthcare access.

**During our updated search in December 2021, we found several studies reporting healthcare utilisation[28] and provision related to COVID-19 in slums.[30] These studies were not included in this scoping review, since the factors associated with healthcare utilisation and health service provision under the pandemic situation are dramatically different and warrant a separate synthesis.**

We included both primary studies and systematic reviews that examine data collected empirically and that derive their findings based on the data. Both quantitative and qualitative studies (and by extension, mixed methods studies) were considered. Even though slums have existed in both high-income countries and LMICs, the context may be quite different between these countries. For example, while all slums are vulnerable to natural disasters such as tropical cyclones, the impact of these could be far more severe in slums of LMICs due to the different socioeconomic contexts.[31] In this review, we focused on settings in LMICs and excluded studies conducted in high-income countries.

**Study coding and data extraction/charting**

Eligible studies were coded and data-extracted/charted according to a pre-specified, preliminary framework shown in Figure 1 below. The preliminary framework was developed by the review authors based on existing conceptual models related to healthcare access and service delivery[32-35] and was modified during the scoping review process to accommodate new factors/themes identified from the literature. **The refined conceptual framework is shown in Figure 2.**

Based on the refined conceptual framework, each eligible study was coded as being associated with one or more of the three phenomena of interest, namely slum residents'

**healthcare accessing (which covered perception of needs/desire for care, healthcare seeking and healthcare reaching as defined by Levesque et al[34]**), health care utilisation and provision of health services (which covered various arrangements related to service delivery) in slum settings. (Figure 2)

**In addition, to facilitate the organisation of complex evidence in this review, diverse factors reported in the included studies were initially classified into six different categories according to the preliminary framework shown in Figure 1. However, during the data charting process, we realised that many factors such as perception of symptoms and experience from past use of healthcare services did not fit into one of these six original categories. A new category of 'cognitive and experiential factors' was therefore added to the refined conceptual framework (Figure 2) to reflect the emerging themes, which include seven categories:**

(1) Personal and biological factors: these relate to personal characteristics of slum residents, including age, sex, ethnicity and the nature and severity of health conditions.

(2) Cognitive and experiential factors: these relate to personal awareness, knowledge, perception, attitude, belief and experience etc. formed through cognitive process based on upbringing and past events.

(3) Socioeconomic factors: these include income and wealth, economic hardship/poverty and economic opportunities, marital status, education, crime, social capital (such as bonding, trust and reciprocity between close relatives, neighbours and community members),[36] use of technologies for social and economic purposes, commercial and charitable organisations and activities.

(4) Physical environment: this covers natural environment such as proximity to a health facility, built environment and infrastructure such as water supply, transport and

mobile/internet networks, as well as weather conditions and environmental pollutions.

(5) Cultural and religious factors: these include cultural and religious beliefs and activities, and local and national customs.

(6) Legal, political and policy factors: these include government policies and issues related to legal, justice and political systems.

(7) Health system factors: these relate to historical and current organisation and provision of health care that may impact upon provision and delivery of health services in individual slum communities and the services experienced by slum residents.

**In addition to the addition of the 'cognitive and experiential factors' category, another major difference between the preliminary (Figure 1) and refined (Figure 2) conceptual framework relates to the definition of healthcare access. Our preliminary framework adopted the definition by Levesque and colleagues, who defined healthcare access as "the possibility to identify healthcare needs, to seek healthcare services, to reach the healthcare resources, to obtain or use health care services, and to actually be offered services appropriate to the needs for care." [34] However, during our study screening and data charting process, we found that it would be helpful to make a distinction between the process of 'accessing' healthcare (which covers gaining awareness of needs, forming an intention to seek healthcare and taking an action to reach healthcare) and the actual receipt and utilisation of health care ('accessed care') when examining empirical evidence, as healthcare needs could only be met when the latter occurs and this not only depends on factors related to service users (demand side) but also relies on factors related to service providers/planners (supply side). Therefore we separated out utilisation of health care from 'accessing health care' to highlight that it requires a match between demand and supply side factors.**

Data on study population, study design, country in which the study was conducted, methodology, and associated factors were extracted using a data-charting spreadsheet which was developed and continuously updated as the review progressed by two of the reviewers (JEP and YFC). Whether a study was conducted exclusively within slums and whether a comparison was made between slum and non-slum urban or rural residents were also noted. Coding of phenomena and factors and data-charting were conducted by one reviewer (JEP) and checked by a second reviewer (PK, GY, OO, YFC). Disagreements were discussed between reviewers until consensus was reached.

### Patient and public involvement

Given the focus of this scoping review on published literature, we did not directly involve residents and service providers/planners from slum settings. Nevertheless, our wider project has a work package that specifically engages with slum residents and service providers and planners,[28] and early plans and findings of this review were shared with the wider project team who provided comments based on their experiences of community engagement.

## RESULTS

The reporting of this review follows the PRISMA Extension for Scoping Reviews (PRISMA-ScR).[37] Using the search strategy described earlier, a total of **15,091 records were retrieved from the initial and updated searches (Medline 4668, Embase 5090, Web of Science 3553, Cochrane 381, CINAHL 1575),** with **9,916** records remaining after excluding duplicates. Two additional articles[18 38] were identified from references of the included studies. As described earlier, screening was limited to the **4,368** records published from 2016 onwards.

A total of **111** articles were included in this scoping review. (Figure 3) **Thirty-two** studies reported factors associated with healthcare accessing of slum residents, **73** studies reported factors related to healthcare service utilisation, and **10** articles reported the factors related to provision of healthcare services in slums (**four** studies reported factors related to more than one phenomenon of interest). **Seventy-four of the 111 studies were quantitative studies, 21 studies were qualitative studies, and 14 studies were undertaken using mixed-methods**. The remaining two studies were systematic reviews. A total of **42 (38%) studies were conducted in India, followed by Kenya (14 studies, 13%)**. (Table 1)

Table 1. Characteristics of included studies.

| Category | Subcategory | | Number of studies (%) | |
|---|---|---|---|---|
| Publication year | 2016 | | 22 | (20) |
| | 2017 | | 17 | (15) |
| | 2018 | | 23 | (21) |
| | 2019 | | 22 | (20) |
| | **2020** | | **18** | **(16)** |
| | **2021** | | **9** | **( 8)** |
| Analysis method | **Quantitative** | | **74** | **(67)** |
| | **Qualitative** | | **21** | **(19)** |
| | **Mixed-methods** | | **14** | **(13)** |
| | Narrative synthesis | | 2 | ( 2) |
| Study location | Asia | **India** | **42** | **(38)** |
| | | **Bangladesh** | **9** | **( 8)** |
| | | **Nepal** | **4** | **( 4)** |
| | | **Pakistan** | **3** | **( 3)** |
| | | **Myanmar** | **2** | **( 2)** |
| | | **Iran** | **2** | **( 2)** |
| | | **Sri Lanka** | **1** | **( 1)** |
| | South America | **Brazil** | **7** | **( 6)** |
| | | **Peru** | **2** | **( 2)** |
| | Africa | **Kenya** | **14** | **(13)** |
| | | **Ethiopia** | **7** | **( 6)** |
| | | **Malawi** | **4** | **( 4)** |
| | | **Uganda** | **3** | **( 3)** |
| | | **South Africa** | **2** | **( 2)** |
| | | **Sierra Leone** | **1** | **( 1)** |
| | | **Nigeria** | **1** | **( 1)** |
| | | **Egypt** | **1** | **( 1)** |
| | | **Zambia** | **1** | **( 1)** |
| | | **Namibia** | **1** | **( 1)** |
| | | **Ghana** | **1** | **( 1)** |
| | North America | Haiti | 1 | ( 1) |
| | Multiple nations | | 1 | ( 1) |
| Healthcare services in slums* | Healthcare accessing | | **32** | |
| | Healthcare service utilisation | | **73** | |
| | Provision of healthcare services | | **10** | |
| Total | | | **111** | (100) |

* One study reported factors related to both healthcare accessing and healthcare utilisation and **three** studies reported factors related to both healthcare utilisation and provision of healthcare services

Participants, country, study design, methodology, observed phenomena and outcomes, and factors of interests for each study are described in supplemental tables 1-3. Supplemental table 1 shows **32** studies reporting factors associated with general healthcare seeking behaviours; healthcare seeking for children or women; slum residents' preference for healthcare providers; and healthcare seeking related to HIV testing. Supplemental table 2 presents various factors reported in **73** studies related to general healthcare utilisation as well as use of specific services such as childhood immunisation, maternal healthcare, and possession of health insurance. In Supplemental table 3, **ten** studies reporting factors related to the provision of health services in slums are summarised. Key findings are described below.

**Demand side: Factors associated with healthcare accessing and healthcare utilisation of slum residents**

We found **104** articles which identified many different factors affecting healthcare accessing and utilisation. These factors are often inter-related and exert their influence at different levels (e.g. from personal, family to community level) in different circumstances. We classified various factors into seven categories (Figure 2). Factors particularly relevant to slum settings and other commonly identified factors within each category are highlighted below.

Personal and biological factors: The common factors associated with healthcare **accessing** and utilisation included intrinsic factors such as **age**[21 39-56], **sex**[18 21 41 46 52 54 56-59], and ethnicity,[21] familial factors such as birth order of the sick child,[21 47 60-62] as well as personal health and **type of illness**[46 59], **disability**[48] **and morbidity**[21 52 63 64] and the specific features of the health condition.[53 56 65] **Slum residents are more like to seek healthcare services when sick children are younger,**[49 50 53 56] **but evidence on the association between mother's age and**

**child's vaccination was inconsistent.[21 39] Healthcare seeking and utilisation were different by sex, but the association was context dependent. Several studies reported higher healthcare utilisation among female slum dwellers,[18 52 56 58] while other studies showed male children had higher vaccination coverage[57] and incurred more medical expenditure.[59] Major life events such as recent migration[21 50 66-68] and relocation[49] into slums tend to be associated with lower healthcare seeking and utilisation. Recency of migration to slums was also related to lower uptake of Rashtriya Swasthya Bima Yojana (RSBY), a national health insurance programme run by the Indian government for poor families.[69] People with specific symptoms (such as fever, tachypnea, persistent vomiting),[53 56 65] disability[48] and illnesses including chronic disease[21 52 54 63 64] tend to use healthcare services more. Although people with tobacco habit were less likely to participate in breast cancer screening, they were more likely to take part when they had family history of cancer or history of cancer screening.[70] Lower birth order of the child was associated with increased utilisation of hospitals for childbirth,[21 47 60-62] while the use of family planning service[47] and out-of-pocket expenditure was higher in multigravida than primigravida.[63]**

Cognitive and experiential factors: these factors were not included in our initial conceptual framework but rather emerged inductively from our data. Consequently, their identification led us to revise the conceptual framework for this scoping review. A wide range of factors formed through cognitive processes and influenced by individual's upbringing, past experience and surrounding environment were reported to be associated with both healthcare-seeking and healthcare utilisation of slum residents. Perception,[39 51 53 68 71-77] knowledge[53 78-83] and experience of symptoms and illnesses[51] were commonly found to influence healthcare seeking

and utilisation. **Mothers who experienced child death and subsequently planned pregnancy showed higher use of antenatal healthcare services.[51] When people perceived the symptom or disease to be serious they tend to seek healthcare services.[53 71 73 77] Although lack of knowledge could be a barrier to accessing healthcare services,[78 79] one study showed caregivers with good knowledge of child danger signs were less likely to seek healthcare services timely.[53] People perceiving their health status as good showed lower odds of having insurance,[84] but awareness and knowledge of health problems lead people to use healthcare services.[39 74 76 80 81 83] Home remedy and home management delayed healthcare seeking behavior.** [53 71 82 85] In addition, perception,[21 42 64 76 84 86-90] knowledge,[21 42 49 61 68 75 82 86 91-96] and experience of healthcare services[39 50 60 62 67 70 75 80 87 97 98] including fear and distrust of healthcare services,[21 38 68 72 75 76 79 89 99-101] and preference related to care provider's gender[88 102] were frequently cited factors. Provider shopping associated with distrust of healthcare providers and denial of diagnosis delayed first care seeking and treatment initiation of pulmonary tuberculosis patients in India.[71] Perception or experience of healthcare services also affected uptake or renewal of health insurance.[84 95]

Socioeconomic factors: **Socioeconomic status was associated with utilisation of healthcare services,[21 39 40 47 57 62 82 103] and even though one study showed that slum residents of lower socioeconomic class were more likely to enrol in health insurance than slum residents of higher socioeconomic class,** [40] **the latter were more likely to use healthcare services.[39 47 57 62] One study reported higher public hospital visits (compared with private hospital visits) among lower socioeconomic status.[104] Income and wealth[21 41 49-51 61 66 68 81 105-109] including financial constraint[19 21 38 46 74 77 79 85 87 90 101 103 110-114] featured prominently. Higher education level [39 49 56-59 61 62 66-68 70 81-83 107-109 115-117] and higher income**

21 49-51 56 58 61 66 68 81 105 107-109 118 were associated with more seeking and utilisation of healthcare services. With some exceptions,[67 105] previous studies reported that employed slum residents tend to seek and use healthcare services more frequently than unemployed slum residents and housewives.[49 51 66 67 70 81 83 84 119] Even though married people tend to seek and use more healthcare services,[18 70] the reported influence of family type was inconsisent.[39 51 116] Female slum residents in nuclear family used more antenatal services than those in joint family type,[51] but female in joint family type used more postnatal service[39] and immunisation service for their children.[116] Smaller family size used more maternal healthcare services,[67] and bigger households had higher odds of having health insurance.[69] The socioeconomic challenges faced by slum residents also manifested as competing priorities [74 94 120] and lack of time[21 101 121] for healthcare-seeking and utilisation, because they did not want to or could not afford to miss work and lose income,[21 71] which can be exacerbated by lack of social support.[75 77 88 94 100 122]

Physical environment: Slum residents considered proximity of healthcare facilities,[21 38 47 77 81 85 86 96 109 123-127] transport such as travel assistance,[77] lack of transportation,[38 83 103] traffic congestion,[128] and environment of residence area when they sought and used healthcare services. Long distance from health facility,[38 55 77 85 102 123] no transportation or travel assistance,[38 83 103] unsafe environment of residential area such as darkness at night were reported as barriers to reaching healthcare facilities.[100]

Cultural and religious factors: these included religion;[41 57 60 70 76 115 129] sociocultural influence[94 102] such as exposure to media[80 98]; stigma associated with unplanned/extramarital pregnancy[79 94] postpartum depression[130] and other illnesses such as contagious skin disease,

barrenness and female sexually-related problems;[102] and use of traditional/home medicine.[76 87 100] Women in slums could not go to hospital because they had difficulties in disclosing the symptoms, postponed their health issues because of their responsibilities at home, and engaged in self-treatment practices such as home remedies recommended by grandmother and friends because of socio-cultural influences toward healthcare-seeking behaviour.[78] Women in Ethiopia reported not returning to postnatal care due to religious and cultural expectation for mother and baby to stay home for 80 days after birth.[94] One Indian survey showed that some women could not seek healthcare services during labour since their husband or family did not allow that.[38]

Legal, **political and policy factors**: type of slums (in terms of official recognition and availability of basic facilities) and possession of a ration card were found to be associated with uptake of the Indian RSBY national health insurance programme.[69] One study reported that slum residents could not seek healthcare facilities for abortion because of the perceived illegality of abortion.[79]

Health system factors: slum residents were also influenced by many factors related to health systems when they sought healthcare. These included accessibility associated with the location[21 102] and timing of services;[21 85 87] quality of healthcare services[38 67 86 87 102 113 125] such as delay in advising patients to go for related tests or referral,[71] likelihood of receiving appropriate examination,[85 110] and adverse events.[76] Slum residents considered service organisation including medical turnover,[131] availability of supplies/healthcare workers,[47 85 110 113] attitude of healthcare providers,[87] type of healthcare facilities,[38 86 117 132] and waiting time.[73 85-87 110 112 133] **Slum residents tend to seek government and non-governmental organisation**

**(NGO) facility[118] and avoid private hospitals[38] for healthcare services. Healthcare utilisation was higher among slum residents with healthcare insurance than those without it,[18 83] and households with higher quarterly out-of-pocket healthcare expenditure had lower scores for an index of access to primary health care.[135]** In an Ethiopian study, some participants reported unavailability of female birth attendants as a reason for not delivering at healthcare facilities.[113] (Table 2)

Table 2. Factors associated with healthcare accessing and healthcare utilisation in slums **from service user's (demand side) perspective.**

| Factors | Healthcare accessing | Healthcare utilisation |
|---|---|---|
| Personal and biological factors | | |
| Age | **(-) Age[53-56]** | **(±) Age[21 39-52]**; **(+)** age of household head[18] |
| Gender | **(±) Sex[54 56 58 59]** | **(±) Sex[18 21 41 46 52 57 59]; (male) sex of household head[134]** |
| Ethnicity | | Ethnicity[21] |
| Migration | | **(-)** Recent migration[21 50 66-69]; **(-)** relocation[49]; **(-)** return to home village[21] |
| Biological | **(+)** Symptoms such as fever, tachypnea, chest in drawing, persistent vomiting[53 56 65]**; having disease[54]** | **Type of illness[46 59]; (+)** having a disability[48]; **(+) morbidity[21 52 63 64]** |
| Other personal | **(-)** Tobacco habits [70]; **(+)** family history of cancer and history of cancer screening [70] | **(-)** Birth order of sick child [21 47 60-62]; **(-) parity [42 47 63 135]** |
| Cognitive and experiential factors | | |
| Knowledge/experience of symptoms and illnesses | **(+)** Perception of symptoms[71] or illness[53 73 77]; **(±)** knowledge of symptom/disease[53 78 79]**; (-)** denial and complacency[72] | **(+)** Experience of child death[51]; **(+)** planned pregnancy[51]; **(+)** perceived health status[84] and health problem[39 74 76]; **(+)** knowledge of symptom[83]; disease[80 81] |
| Ability/experience in handling health related conditions and perceived needs for accessing health services | **(+)** Awareness of the need for healthcare services[38 54 56]; **(-)** home remedies[71] or management of childhood illness[53 85] | **(+) Perceived needs for healthcare services[21 68 75 76 91 94 113 129]; (-) home delivery[82]** |
| Perception/knowledge/experience/preference of health services | **(-)** Fear of mistreatment[72 101] and **(-)** doubts about medical care[38 79 100]; gender-induced affordability[102]; **(-)** provider shopping[71] | **(positive)** Perception of healthcare services[21 42 64 76 84 86-90] and providers[21 85 94 112 125]; **(+)** knowledge of health services[21 42 49 61 68 75 82 86 91-94] or facilities[21 95 96]; **(+) previous use of related healthcare services[39 42 50 60 62 67 80 97 98]; (-)** bad experiences of friends and relatives at healthcare facilities[95]; **(-) misunderstanding or fear[21 68 75 76 89 99 129]**; gender healthcare worker preference[88]; **(-) side effect[82]; lack of trust[46]** |
| Socioeconomic factors | | |
| Socioeconomic status | **(-)** Social class[104]; **social group (caste) of caregiver[54]** | **(+)** Socioeconomic status[21 39 40 47 57 62 82 103]; Caste[109 115]; (rent-> negative) residential background[21 47 69 82]; **(+)** possession of ration card[69] |
| Marital status | **(married)** Marital status[70] | **(married) Marital status[18 41]; duration of marriage[42]** |
| Family composition & Living arrangement | **(-) Family size[54]** | **(±)** Family type[39 51 116 127]; **(±)** family size[67 69]; **(-) number of children in household[21 44 49]**; **(+)** number of male children[136]; **(+)** housing condition[21] |
| Education | **(+)** Education[54 56 58 70] | **(+)** Education[39 41 42 45 49 57 59 61 62 66-68 81-83 107-109 115-117 127 135]; **(±) husband education[44 51]**; **(+) mother's education and literacy[21 43 47 57 60]** |
| Income and wealth | **(+)** Income[56 118]; **(+)** wealth[55 58]; **(-)** | **(+)** Income[41 50 51 68 81 105]; **(+)** wealth[21 49 61] |

| | | |
|---|---|---|
| | inability to afford care [19 38 77 79 85 90 101 110 111] | [66 106-109]; (-) financial constraint[21 46 74 87 103 112-114] |
| Occupation | (+) Occupation[54 58 70] | (+) Employment[21 66 84 119 127]; (±) occupation[49 67 81 83 105 135]; (±) occupation of spouse[51 61] or household[69] |
| Social support | (-) Difficulty in reaching services (security risk at night)[100]; (+) accompanying person[77]; **decision making person for seeking health care[54]** | (+) Family support[75 88]; (+) social connectedness[94]; (+) socioeconomic support[122]; **permission for immunisation by decision-maker[129]** |
| Competing priorities/lack of time | (-) Competing priorities (ability to work and income)[120]; (-) not want to miss work[71]; (-) lack of time[101 121] | (-) Competing priorities[74 82 94]; (-) risk of lost income[21]; (-) parents being too busy[21] |
| Physical environment | | |
| Distance from health facility | Proximity of healthcare facilities[38 55 77 85 123]; geographical distance of formal healthcare[102] | (-) Distance from health facility[21 47 81 86 96 109 124-127] |
| Transport | (+) Travel assistance[77]; (-) no transportation[38] | (-) Lack of transportation[83 96 103]; (-) variability in traffic congestion[128] |
| Environment of residence area | (-) Difficulty in reaching services (darkness at night)[100] | Residential background[21 69 106] |
| Cultural and religious factors | | |
| Religion | Religion[70] | Religion[41 57 60 76 115 129] |
| Sociocultural influence | (-) Stigma[79 102 130]; mother tongue[70]; (-) difficulties in disclosing the symptoms, (-) neglecting behaviours, and socio-cultural influences[78]; (+) cultural competency of care[102]; (+) easy communication[102]; living with the burden of cultural expectations[102]; (-) no permission to seek care from family[38] | (-) Exposure to media[80 98]; **stigma[129]**; (-) cultural expectation for women after birth and fear of stigma for pregnancy out of wedlock[94] |
| Tradition | (-) Traditional medicine[100] | (-) Traditional remedies[76]; (-) home remedies[87] |
| Legal, political and policy factors | | |
| Legal issues | (-) Perceived illegality of abortion[79] | Type of slums and possession of a ration card[80] |
| Health system factors | | |
| Accessibility | (+) Ease of access[102]; (-) late facility opening times[85] | (-) Limited access to the services due to location[91 94]; (-) timing of services[21 87]; household visit by health workers[21] |
| Quality and safety of services | Quality of treatment and expected outcome of therapies[38 102]; (-) delay in advising related tests[71]; referral[71]; optimal examination[85 110]; (-) provider shopping[71] | Quality of service[67 86 87 92 113 125]; (-) adverse events[76] |
| **Charges for health services** | **(+) Insurance coverage of both public and private providers and of extended family members[137]** | **(-) Average out-of-pocket healthcare expenditure[135]; healthcare insurance[18 64 83]** |
| Service organisation and delivery arrangement | (-) Medical turnover and overload or healthcare providers[131]; (+) government/NGO facility[118]; (-) private hospital[38]; **early engagement by healthcare workers[55]** | Attitude of healthcare providers[87 96]; mode of delivery[39 57 60 63 82 138]; (-) hospitals refused to accept health insurance cards[95] |

| | | |
|---|---|---|
| Facility & resources | Availability of medicines and supplies[85 110]; **(-)** lack of healthcare facilities[139] | Type of healthcare facility[40 86 96 117 132 134]; **inadequate resources[91]; (+)** number of available healthcare workers[47]; **(-)** unavailability of female birth attendants[113] |
| Waiting time | **(-)** Waiting time[73 85 110] | **(-)** Waiting time[86 87 112 133] |

**(-)** negative association; **(±)** inconsistent/conflicting evidence or context-dependent; **(+)** positive association; NGO: non-governmental organisation

**Supply side: Provision of healthcare services**

Ten articles described factors associated with provision of healthcare services in slums from the service providers' perspective. None of the studies reported personal and biological factors. Factors related to other categories are summarised below.

Cognitive and experiential factors: Odhiambo et al. reported slum residents' fear of side effects, size of tablet and misconceptions regarding treatment as the factors hindering drug administration activities by healthcare workers for a deworming programme in Kenya.[140] On the other hand, this study also reported a high demand for drugs from slum residents in the final year of this program because people realised that free treatment was to be ended.[140]

Socioeconomic factors: effective community mobilisation was a facilitator[140] whereas poor community support[141] and insufficient time allocated for providers to implement healthcare programmes[140] were barriers for provision of healthcare services in slums. In the deworming programme mentioned above, community health workers reported that direct observation of slum residents taking deworming drugs after meals was sometimes not feasible because slum residents skipped or age late at night due to food shortage.[140] Some slum residents demanded money to take the deworming drugs, either to facilitate purchase of food or to have their own share of the money that they perceived the community health workers would be paid by the programme if they complied with taking the drugs.[140]

Physical environment: poor sanitation,[140 142] presence of rodents and no pavement,[142] bushy and unprotected environment[140] were reported as factors making the provision of healthcare services difficult in slums.

Cultural and religious factors: religious beliefs and mistrust of interventions,[140] lack of a shared understanding of the needs, purposes and consequences of family planning and pregnancy related services among slum residents and healthcare providers[74] were the barriers

for healthcare services provision. In the previous deworming programme, portrayal of unrelated death being linked to the programme and related negative publicity affected participants' compliance.[140]

**Legal, political and policy factors**: devolution of service delivery through downward transfer of funds and responsibilities from central/national government level to elected local bodies; management by professional managerial and technical cadres; tight organisation of public health services; and professional support from the state directorate of public health were found to strengthen public health service provision in Chennai slums compared with Delhi.[143] One study reported that policies affected healthcare provision negatively because of staff shortage arising from change and suspension of the appointment of health promotors, which led to overwork and lack of time to provide required care by healthcare staff. [133] In Brazil, home visits for the provision of healthcare services was hampered because slum residents could not present documents required to register for healthcare.[142] On the other hand, giving priority to socially less developed areas for strengthening the Family Health System in Brazil might have been associated with better service coverage for slum residents with tuberculosis compared with their urban non-slum counterparts.[144]

Health system: pay scale of frontline healthcare workers,[141] knowledge of intervention area by community health workers,[140] issues related to rigid task assignment by service managers,[142] requirement to follow standardised protocol,[142] demands from the management,[142] work burden[133] [142] and no incentive,[141] insufficient time,[140] attitude[74] and support of healthcare providers,[141] **ill-defined geographic boundary of service with unserved areas and left-out urban slum pockets[145]** were associated with healthcare service provision in slums. Lack of community-based care (such as school-based education for reproductive health and community support networks for women),[133] **unreliable immunisation and household data[129];**

**inefficient utilisation of funds,**[129] affordability (price) and availability of medicine,[146] limited medical supplies[74 141] and infrastructural facilities,[141] inadequate space and equipment,[142 145] **suboptimal training of staff,**[145] **insufficient availability of logistics, and health manpower**[145] also affected service provision. (Table 3)

Table 3. Factors associated with provision of healthcare services in slums **from service provider's (supply side) perspective.**

| | |
|---|---|
| Cognitive and experiential factors | |
| Perception/knowledge/experience/preference of health services | Fear of side effects, size of tablet and misconceptions regarding treatment, high demand for drugs in the final year of treatment[140] |
| Socioeconomic factors | |
| Income and wealth | Difficulty in directly observing deworming treatment at meal time due to food shortage[140] |
| Social support | Effective community mobilisation[140]; poor community support[141]; **non-involvement of community members and Urban Local Bodies[145];** absence of community members during the drug administration exercise[140]; demand for incentives by community members to take deworming drugs[140] |
| Physical environment | |
| Environment of residence area | Environment (sanitation, territory)[142]; unsanitary environmental conditions[140]; inaccessibility (filthy and bush environment)[140] |
| Cultural and religious factors | |
| Religion | Religious beliefs and mistrust of interventions[140] |
| Sociocultural influence | Lack of shared understanding of the problems in community[74]; unrelated death and the associated negative publicity (of a deworming programme) by the media[140] |
| Legal, political and policy factors | |
| Policy issues | Devolution of service delivery transferring funds and responsibilities to elected local bodies [143]; management by professional managerial and technical cadres[143]; tight organisation of public health services[143]; professional support from the state directorate of public health[143]; healthcare policies[133]; policy prioritizing low social development areas [144] |
| Legal issues | Fear of requirement for formal registration[142] |
| Health system factors | |
| Cost | Pay scale of frontline healthcare workers[141]; medicine price[146] |
| Quality and safety of services | Knowledge of intervention area by community health workers[140] |
| Service organisation and delivery arrangement | Issues related to assignment of tasks[142]; requirement to follow standardised protocol [142]; demands from the management[142]; work overload[133 142]; **underperformance of staff[129];** documentation work/work burden/no incentive for work[141]; insufficient time[140]; attitude of healthcare providers[74]; lack of supportive staff[141]; community health worker familiarity with households led to warm reception[140]; opportunity to integrate mass drug administration with other health interventions[140]; presence of community health workers and their supervisory structure, and points of referral for serious side effects[140]; **restriction of range of services[145]; unserved areas and left-out urban slum pockets[145]; poor monitoring and supervision[145]; unreliable immunisation and household data[129]** |
| Facility & resources | Community-based care[133]**; inefficient utilisation of funds[129];** affordability and availability of medicine[146]; limited medical supplies[74 141]; infrastructural facilities[141]; inadequate space and equipment[142]; **suboptimal training of staff[145]; insufficient availability of space, logistics, and health manpower[145]** |

### Comparison between slums and other settings

Seven studies which met our inclusion criteria also included data from non-slum urban and/or rural areas and potentially allowed exploration of factors associated with healthcare access across different settings. Key findings from these studies are summarised in Table 4.

These recent studies showed a mixed and dynamic picture of healthcare access across slum and other settings and reported various factors associated with this. For example, the proportion of young children fully immunised was found to be lower in slums compared with non-slum urban setting but was higher than rural settings in Nigeria. Nevertheless the coverage improved over time across all settings.[60] While many common factors associated with full immunisation of young children were identified, giving birth in health facilities (as opposed to home) had a larger positive effect on subsequent immunisation coverage in slums compared with non-slum urban and rural settings.[60] A narrowing of gaps in delivery by skilled birth attendants between slum and non-slum urban settings over time and a reverse of the trend from having lower usage to higher usage of modern contraceptive methods by married women in slums versus urban non-slums were reported in Bangladesh.[47] Slum residents reported financial issues being the main reason for not taking prescribed drugs whereas getting better was the cited main reason for urban non-slum residents in Iran.[114] Better coverage of services and higher rates of treatment completion were reported for patients with tuberculosis in slums compared with non-slum urban setting in two studies in Brazil,[52 144] where a higher priority given to enhancing the Family Health system in socially less developed areas in recent years was suggested to be a likely factor associated with better service provision in slums.[144] (Table 4)

Table 4. Studies that examined factors associated with health care seeking and utilisation in both urban slum and non-slum urban and rural settings

| Study & location | Differences in healthcare access | Associated factors |
|---|---|---|
| **Kanyango (2021)[137]** | ***Preferences and willingness to pay for health insurance***<br>Households in non-slum communities had a high preference for health insurance plans covering chronic illnesses and major surgeries to other plans. | Coverage of extended family (vs restricted enrollment of children); coverage of both private and public providers (vs private only) |
| Obanewa (2020)[60] | ***Fully-immunised child coverage (FIC)***<br>Proportion in slum lower than urban non-slum but higher than rural; proportions increased between 2003 and 2013 across all three settings | From multivariable regression*: year, birth order, antenatal attendance, maternal education level, religion, maternal age at child's birth, media exposure, region of the country, interaction between place of residence and place of delivery |
| Angeles (2019)[47] | ***Use of modern contraceptive methods***<br>Proportion changed from being lower in slums in 2006 to being higher in slums in 2013 compared with urban non-slums | From multivariable regression*: parity, mother's age, mother's education attainment, socioeconomic status, interaction (slum × time period) |
| | ***Delivery by skilled birth attendant***<br>Proportion substantially lower in slums compared with urban non-slums but the gaps narrowed over time) | From multivariable regression*: Residing in slums, parity, mother's age, mother's education attainment, length of stay in current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Islam (2018)[107] | ***Antenatal care visits***<br>"there was a large inequality" between slum and urban non-slum (detail not reported) | Level of educational attainment, wealth index of the household |
| | ***Using contraceptive methods***<br>"Prevalence rate higher among slum women" than urban non-slum women | Not reported |

| | | |
|---|---|---|
| Tabrizi (2018)[114] | ***Utilisation of health services in the past 30 days***<br>Similar utilisation overall, but with lower proportion received needed health services and used private clinics, higher use of vaccination and maternal health services, and lower use of services for heart failure and hypertension for slum residents compared with urban non-slum | High cost of services |
| | ***Home care services***<br>Very little use both in slum and urban non-slum areas | High cost of services |
| | ***Prescribed drug during last visit to health facilities***<br>Lower proportion for slum vs urban non-slum | Not reported |
| | ***Not taking drugs prescribed***<br>Higher proportion for slum vs urban non-slum | Main reason: financial problems for slum vs getting better/feeling well for non-slum urban |
| Snyder (2016)[52] | ***Directly observed treatment coverage for tuberculosis (TB)***<br>Higher for slum vs urban non-slum TB patients | Not examined |
| | ***Abandonment of TB treatment***<br>Lower for slum vs urban non-slum TB patients | From multivariable regression*: residency in a slum, sex, age, extrapulmonary clinical disease, HIV/AIDS, interaction (directly observed treatment x residency in a slum) |
| Prado Junior (2016)[144] | ***Coverage under Family Health system for TB patients***<br>Higher for slum vs urban non-slum | Giving the Family Health strategy priority to coverage of areas with lower social development |

*From the model with most comprehensive adjustment including residency in slum as one of the variables; only factors that were statistically significant (at 5% level) are shown. AIDS: Acquired Immune Deficiency Syndrome; HIV: human immunodeficiency virus; TB: tuberculosis.

# DISCUSSION

## Statement of principle findings

This scoping review of recent literature examined demand side factors associated with slum residents' healthcare **accessing and** utilisation, as well as supply side factors associated with provision of health services in slums. **We found over 104 studies related to the former, but only 10 studies related to the latter.** We identified different factors associated with **accessing, utilisation** and provision of health services in slums, and mapped them to a conceptual framework developed and refined for this review into seven broad categories (Figure 2).

## Findings in the context of existing literature

Even though previous reviews have investigated factors associated with healthcare access in various settings,[147 148] to our best knowledge this scoping review is the first that has examined **wide-ranging** factors across different service areas of health care in slums. Our findings are consistent with previous studies which highlighted common factors associated with healthcare seeking and utilisation such as age, income and education.[147 149] We identified several factors that are particularly pertinent in slum settings, such as costs of healthcare,[19 21 74 77 79 85 90 101 103 110-112] lack of time due to slum residents' competing priorities[21 101 121] and issues arising from adverse physical environment,[83 103 140 142] security,[100 142] fear of formal registration due to distrust of the authorities[142] and proximity of healthcare facilities.[21 77 81 85 86 109 123-126] In addition, included studies showed that the effects of a given factor may differ between slum, urban non-slum and rural settings.[60]

Healthcare cost is a major barrier between the intention to seek care and actual utilisation of services. [110 139] **Health insurance could be one of the potential** measures to overcome this barrier.[150 151] **Although possession of/coverage by health insurance was associated with**

**higher levels of utilisation of health services among slum residents,**[18 83] studies showed that uptake of **government-run** public insurance among slum residents was low.[69 84] **This may be attributed to lack of awareness, difficulties in navigating through the health system and in obtaining official proof of identity required for enrolment,**[69] **and poor quality of care and range of services offered.** [69 84] **Even among slum residents covered by health insurance, access to care was often refused and additional charges were frequently requested.**[95] **Policies that aim to improve access to healthcare services among slum residents through public health insurance will need to address these challenges.**

Several studies reported lack of time and competing priorities as a factor affecting healthcare-seeking behaviour[101 120 121] and health services utilisation.[21 74 94] This suggests a delicate balance between factors that individual slum residents have to strike when making decisions on healthcare seeking and utilisation. Var der Heijden et al. showed that health was considered as an asset for working ability in slums,[120] but paradoxically the ability to work often seems to impede healthcare seeking for health issues. This highlights the importance of considering slum residents' interest and priorities when providing healthcare services and promoting healthcare utilisation in slums.

**Strengths and weaknesses of the review**

This scoping review has several strengths. We conducted a comprehensive literature search using generic terms related to slums with few other restrictions. The search was therefore likely to be sensitive for identifying relevant literature. Contemporary methodological guidelines for undertaking scoping reviews were followed,[22] and a conceptual framework which was adapted based on emerging findings was used to facilitate the organisation of evidence.

The review has enabled theory building and refinement of a conceptual framework. Our

preliminary framework included six categories (Figure 1). During data coding and extraction, it emerged that many studies reported perception, knowledge, and experience of slum residents being associated with their healthcare-seeking and utilisation. We subsequently classified these factors as cognitive and experiential factors, which primarily consists of three subcategories: knowledge/experience of illness, perceived needs for accessing healthcare services, and perception/experience of healthcare services. These factors were influenced by other factors included in our original conceptual framework, but highlighted the crucial links between those factors and the ultimate actions by individual slum residents to access health services. Future interventions to promote health service utilisation for slum residents[152] could make use of our framework to develop programme theories and map out causal pathways.

This review also has some limitations. Given time constraint, we were only able to examine the most recent literature published in English **in academic journals**,, and have not examined the methodological quality of individual studies (which we noted to be quite varied) in detail. We attempted some preliminary synthesis to configure the identified evidence but have not explored the complex relationship between the factors identified **and their interplay with the context of individual slums** in depth. Nevertheless, findings from this scoping review will provide a good foundation for further syntheses.

**Methodological considerations**

A number of challenges in the process of classifying and coding data are worth mentioning. **Firstly, access to healthcare has been conceptualised and defined in various ways in previous studies. The World Health Organization suggested six building blocks of a health system including service delivery, health workforce, health information systems, access to essential medicines, financing, leadership/governance to strengthen health**

**systems,[153] and in the report, defined access to healthcare as public responsibility for ensuring all citizens' entitlements to the protection of their health beyond simply proportion of a target population that benefits from an intervention or universal coverage.[153] They also pointed out system constraints such as financial access difficulty, physical access difficulty, low knowledge and skills, poorly motivated staff, weak leadership and management, ineffective intersectoral action and partnership as barriers to access.[153] The WHO's definition and conceptual framework focus on health system level factors and would be particularly useful when examining supply side factors, which seem to be under-studied based on our findings. As described in the Methods section, we primarily adopted the conceptual model of healthcare access developed by Levesque and colleagues given our shared focus on service users. However, in our conceptual model we separated the dynamic stages of 'accessing' healthcare from the actual 'accessed' healthcare utilisation to highlight the crucial match required between the demand side and supply side factors to facilitate access to healthcare.**

Several factors associated with healthcare accessing and utilisation can be viewed from different perspectives and therefore potentially be coded under different categories. For example, barriers for healthcare seeking and utilisation related to costs can be considered as socioeconomic issues from the slum dwellers' perspective but can also be viewed as health system issues for not offering the services in an affordable way. Indeed, previous access frameworks suggested that access is created and negotiated in a dynamic interchange between households/communities and healthcare workers/systems (i.e. demand and supply) on each access dimension.[34 154] In such situations, we tried to code a factor under the category that most directly reflects the original data through discussions within the review team (in the example of healthcare cost, the factor was coded primarily under socioeconomic factors rather than

health system factors when the factor was reported by slum residents as a barrier); otherwise more than one category was coded (for example, bad experience from previous utilisation of health services was coded both as a cognitive and experiential factor and a health system factor).

**Implication for research and practice**

The multitude of factors identified in this review are often inter-related and inter-acting, and span across personal, family, community and society levels. For example, the association between occupation and healthcare utilisation were reported in several studies.[49 61 67 81 83 105] The effect of predominantly casual work undertaken by slum residents on their healthcare access could be mediated through working hours, income level, knowledge of health and available services, etc. There is also possibility that occupation was associated with health status and hence needs for healthcare services, instead of/in addition to behaviour of using healthcare services. Teasing out the complicated relationships between various determinants **and their interaction with the diverse contexts of slums** will require in-depth analysis and a more holistic approach to synthesising the evidence. Given the unique features of individual slums, service planners and policy makers will need to examine these relationships with due consideration to the context specific to each locality and geospatial features and neighbourhood effects that characterise slum settings.[4]

We found far fewer studies that have examined health service providers' perspective than studies that have investigated factors associated with accessing healthcare from slum residents' perspective. There may be scope for greater research and policy attention to supply-side factors, including experiences and practices of local frontline healthcare providers, availability of healthcare facilities and infrastructure and policy to support them in order to overcome the many barriers highlighted from both supply and demand sides.

Although only six of the included studies explored factors associated with healthcare access or health service provision across slum and non-slum settings, they showed a generally encouraging picture that access to and provision of healthcare are continuously evolving (and often improving) in slums and other settings, and equality between different settings is not beyond reach.

## CONCLUSION

This scoping review summarises a large body of recent literature evaluating factors associated with seeking and utilisation of healthcare by slum residents, but found substantially fewer studies examining factors associated with provision of health services from providers' perspective. Recent migration into slums; knowledge, perception (including misconception and distrust) and past experience of illness, healthcare needs and health services; financial constraint, competing priorities and inadequacy of social support; adverse physical environment and unfavourable locality; sociocultural expectations and stigma; lack of official recognition; and various problems in existing health system all contribute towards the challenges faced by slum residents. Future research and policy aiming at improving healthcare services in slums should pay more attention to supply side issues ranging from individual healthcare providers and practices to structural and policy level factors to tackle different barriers faced by slum residents, which in turn need to be evaluated holistically and take into account local context and geospatial features of slums.

**List of abbreviations**

GRADE: Grading of Recommendations Assessment, Development and Evaluation

LMICs: Low and Middle income Countries

MMAT: Mixed Methods Appraisal Tool

WHO: World Health Organization

**Ethics approval**

Not applicable. This realist synthesis included literature that is available in the public domain and did not involve the collection of personal data.

**Consent for publication**

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**Availability of data and materials**

All data relevant to the study were included in the article or uploaded as supplementary information. No additional data were available.

**Competing interests**

The authors declare that they have no competing interest.

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**Contributor**

JEP, BH, MA, FG and YFC conceptualised the scoping review; JEP carried out literature searches; JEP, PK, GY, OO, and YFC participated in study screening and coding; JEP and YFC performed data charting and drafted in initial manuscript. NA, PG and RL provided critical input during the drafting of the manuscript. All authors commented on and contributed to the revision of subsequent versions and approved the final version for submission.

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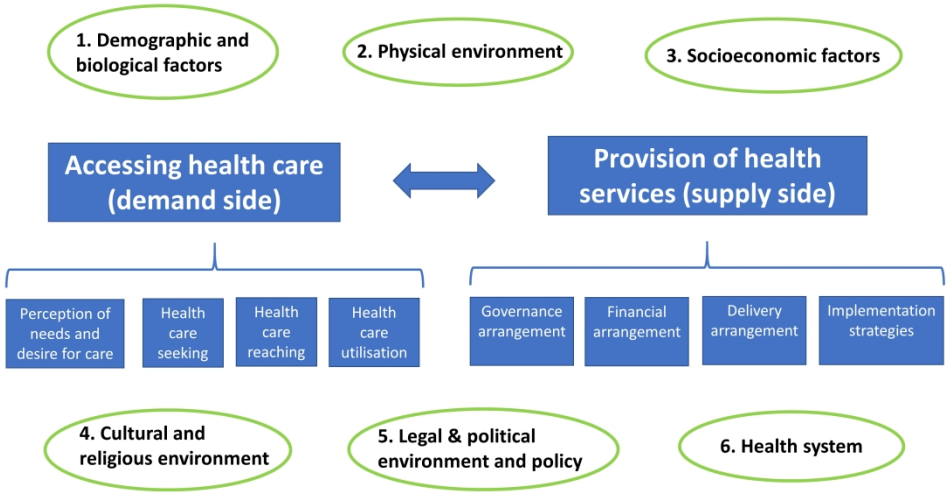
Figure legends.

Figure 1. Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

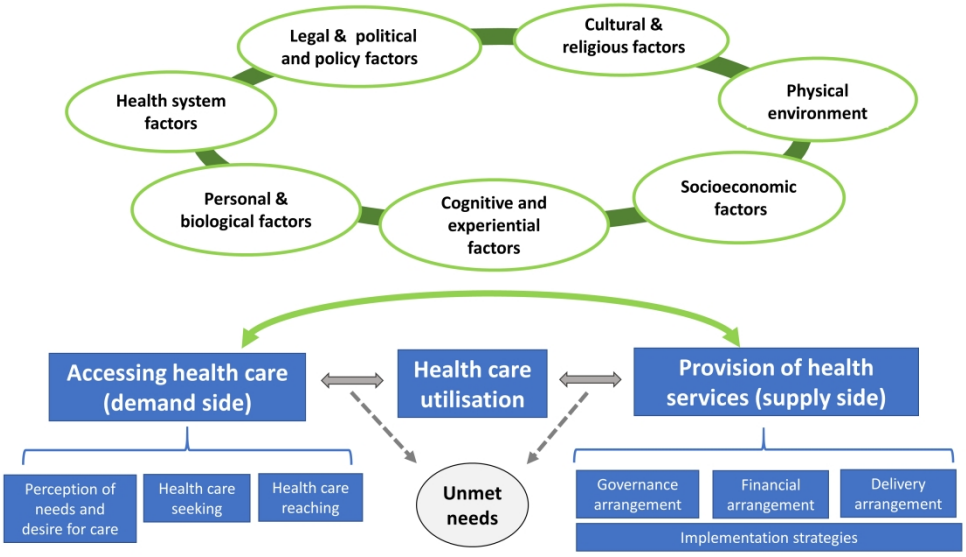
Figure 2. Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

Figure 3. Flowchart



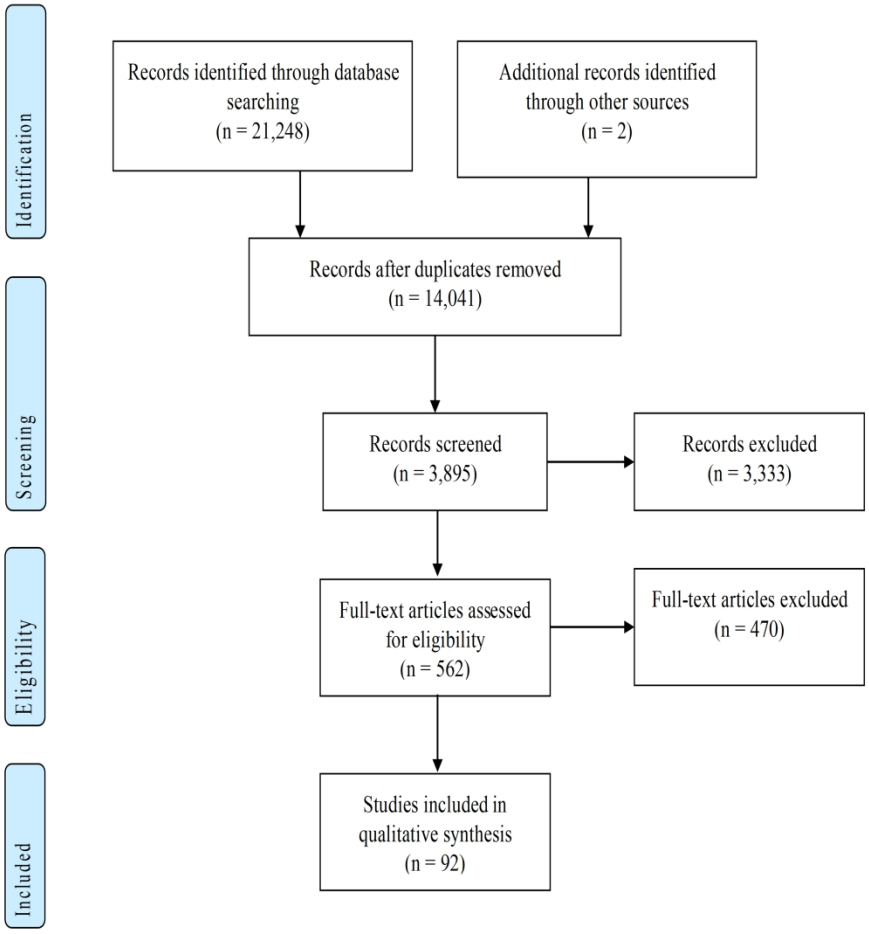

Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

338x190mm (300 x 300 DPI)




Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

338x190mm (300 x 300 DPI)




Flowchart

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Supplement 1. Healthcare-seeking behaviours of slum residents reported by included studies and associated factors.

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General healthcare seeking behaviour | **Pakhare (2021)[55]** | **Slum residents diagnosed hypertension or diabetes** | **India** | **Prospective study** | **Quantitative** | **Linking to healthcare facilities** | **Age; wealth; distance to facilities ; early engagement by healthcare workers** |
| | Gaiha (2020)[121] | Hetero-couples in slums | India | Cross-sectional study | Mixed method | Ability to attend an health promotion activity | Lack of time related to work as a reason for low male participation |
| | van der Heijden (2019)[120] | Female workers and key informants in slums | Bangladeshi | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Competing interest (ability to work and income) |
| | Aleemi (2018)[118] | Slum residents | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Household income; government facility; NGO facility |
| | Wekesah (2019)[139] | Slum residents | Kenya | Cross-sectional study | Qualitative | Care-seeking and adherence to treatment for CVD | Cost of healthcare; lack of healthcare facilities |
| | Kar (2017)[58] | Slum residents | India | Cross-sectional study | Quantitative | Undiagnosed hypertension | Sex; poverty; unskilled laborer; literacy |
| | Mistry (2016)[71] | TB patients in slums | India | Retrospective study | Quantitative | Delays in care seeking | Perception of symptoms; home remedies; not want to miss work; provider shopping; delay in advising TB-relevant tests; referral. |
| | Kulkarni (2016)[70] | Women in slums | India | Cross-sectional study | Quantitative | Participation in breast cancer screening | Age; education; religion; Mother tongue; occupation; marital status; tobacco habits; family history of cancer; history of cancer screening |
| | Misra (2017)[101] | Slum households | India | Cross-sectional study | Quantitative | Health-seeking practice for cataract | Lack of time, fear of surgery, financial difficulties |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ramagiri (2020)[77] | Slum residents with diabetes | India | Case control study | Mixed-method | Uptake of diabetic retinopathy screening | Realization of consequences of disease; travel assistance and proximity of the screening facility; absence of an accompanying person; cost |
| Healthcare for children | **Mohanty (2021)[54]** | **Caregivers of under-five children in urban slums,** | **India** | **Cross-sectional study** | **Quantitative** | **Healthcare seeking for children** | **Sex of child; size of the household; social group of caregiver, mother with mass media knowledge; age of mother; education and occupation of mother; suffering from chronic disease; decision making person for seeking health care; time lapse in approaching the health care facility; income loss due to children illnesses** |
| | Lungu (2020)[53] | Caregivers of children under 5 years of age in slums | Malawi | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Age; illness was perceived to be severe; fever; home management of childhood illness |
| | | | | | | Timely healthcare seeking behaviour | Home management of childhood; knowledge of caregivers about child danger signs |
| | McNairy (2019)[19] | Slum households with children ≤ 5 years old | Haiti | Cross-sectional study | Quantitative | Healthcare access | Inability to afford care |
| | Hutain (2019)[100] | Caregiver at the time of the child's death in slums | Sierra Leone | Cross-sectional study | Mixed-method | Health care-seeking | Use of traditional medicine; difficultly reaching the health facility; doubts about need for medical care; mistreatment by staff |
| | Kerai (2019)[56] | Caregiver of children aged 2 months to 5 years in slums | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Age of child; gender of child; income; education of caretaker; vaccine awareness; breastfeeding awareness; |

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|---|---|---|---|---|---|---|---|
| | | | | | | | presence of symptoms such as fever, tachypnea, chest indrawing, persistent vomiting, recurrent illness. |
| | Lungu (2018)[110] | Caregivers of children under 5 years of age in slums | Malawi | Prospective study | Quantitative | Healthcare-seeking behaviour | Cost; waiting time; availability of medicines and supplies; attitude of health workers; thorough examination of the child |
| | | | | | | Willingness to pay for the health facility | Waiting time; availability of medicine and equipment; superficial or thorough examination; attitude of health workers |
| | Kamati (2019)[73] | Slum residents | Namibia | Cross-sectional study | Mixed-method | Self-medication | Perceived diagnosis as "minor or mild"; waiting times and queues to receive care |
| | Mishra (2017)[65] | Mothers living in slums with a child and migrated recently | India | Cross-sectional study | Quantitative | Healthcare seeking behaviour | Symptoms and severity |
| | Lungu (2016)[85] | Caregivers and health providers in slums | Malawi | Longitudinal study | Qualitative | Healthcare-seeking behaviour | Home management; lack of medicines and supplies; waiting times; facility opening times; attitude of health workers; suboptimal examination of the sick child; distance to health facility; cost of healthcare |
| Healthcare for women | Muralidharan (2019)[123] | Girls and mothers in slums | India | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Proximity of healthcare facilities |
| | Nasrin (2019)[111] | Married women with a child in slums | Bangladesh | Cross-sectional study | Mixed-method | Healthcare-seeking behaviours | Inability to spend the treatment cost |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jayaweera (2018)[79] | Girls and women in slums | Kenya | Cross-sectional study | Qualitative | Access to contraception and abortion in health facilities | Stigma; lack of education about safe methods of abortion; perceived illegality of abortion; limited access to services because of financial barrier; fear of mistreatment and mistrust of health providers/facilities; geographical proximity |
| | Williams (2018)[130] | Mothers and medical personnel in slums | Bangladesh | Cross-sectional study | Qualitative | Mental healthcare seeking | Culture and stigma |
| | Ilankoo (2018)[78] | Women in slums | Sri Lanka | Cross-sectional study | Qualitative | Health-seeking behaviours related vaginal discharge | Confusion in differentiating normal from abnormal vaginal discharge; effects on day-to-day life; confusion toward the causative factors; difficulties in disclosing; neglecting behaviours; and socio-cultural influences toward health-seeking behaviours. |
| | Athie (2017)[131] | Anxious and depressed women in slums | Brazil | Cross-sectional study | Qualitative | Healthcare seeking behaviour | High medical turnover and overload of healthcare providers |
| | Sudhinaraset (2016)[90] | Mothers and their families in slums | India | Cross-sectional study | Qualitative | Maternal health services and delivery experiences | Financial barriers; disrespectful care |
| | Pune Municipal corporation[38] | Recently delivered slum residents | India | Cross-sectional study | Mixed-method | Seeking front-line worker during labor | No time to call; family did not allow; being out of town; lack of trust; delivery at night |
| | | | | | | Going to the Referred Place for Pregnancy Complications | Not necessary; family did not allow; lack of trust/poor quality services; don't like going to a difference facility; too far; cost; no transportation; private hospital |
| Preference for | Das (2018)[102] | Slum | India | Cross- | Qualitative | Healthcare-seeking | Female prefer informal healers |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| healthcare providers | | residents | | sectional study | | practice (preference for formal/informal healers) | (cultural competency of care, easy communication, gender-induced affordability, avoidance of social stigma and labelling, living with the burden of cultural expectations and geographical and cognitive distance of formal health care) |
| | | | | | | | Male prefer formal care (ease of access, quality of treatment, expected outcome of therapies) |
| | Angeli (2018)[104] | Slum residents | India | Cross-sectional study | Mixed-method | Choice between public or private hospital | Bottom-of-the pyramid patients visit a public hospital more than top-of-the-pyramid patients |
| **Health insurance** | **Kalyango* (2021)[137]** | **Households in slum and non-slums** | **Uganda** | **Cross-sectional study** | **Qualitative** | **Willingness to pay for health insurance** | **Public and private providers; extended family enrolment** |
| HIV testing | Thomson (2018)[72] | Stakeholder including residents and healthcare service provider | Kenya | Cross-sectional study | Qualitative | HIV testing | Denial; complacency; fear of death; anticipation of unbearable stress; felt ill; had a partner die; learned that their partner was HIV-positive. |
| Expenditure | Mishra (2017)[59] | Slum households with a child aged 0–14 years and who had migrated within the last 12 years | India | Cross-sectional study | Quantitative | Treatment-seeking behaviour | Child's gender |

*Factors reported in the study were associated with participants covering both slum and non-slum residents. CVD: cardiovascular disease; HIV: human immunodeficiency virus; NGO: non-governmental organization; TB: tuberculosis.

Supplement 2. Healthcare utilisation of slum residents reported by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General utilisation | **Wambiya (2021)[64]** | **Slum household members** | **Kenya** | **Cross-sectional study** | **Quantitative** | **Private and public healthcare utilisation** | **Public- satisfaction with cost; satisfaction with healthcare quality; having acute infection or other diseases**<br><br>**Private- insurance coverage; having acute infection** |
| | **Chauhan (2020)[96]** | **Elderly slum residents** | **India** | **Cross-sectional study** | **Quantitative** | **Utilization of healthcare services** | **Unawareness of healthcare facilities; behaviour of service providers; distance from home; transport facility; amenities at healthcare facilities; convenience for attendants** |
| | **Otieno (2020)[134]** | **Slum household members** | **Kenya** | **Cross-sectional study** | **Quantitative** | **Access to primary healthcare services** | **Sex of household head; average out-of-pocket healthcare expenditure; source of primary care** |
| | **Vora (2020)[46]** | **Slum household members** | **India** | **Cross-sectional study** | **Quantitative** | **Unmet need for surgical services** | **Financial reasons; lack of trust; age; sex; type of problem** |
| | Agrawal (2019)[115] | Older adults in slums | India | Cross-sectional study | Quantitative | Utilisation of welfare schemes | Religion; Caste; education; |
| | Ahmed (2019)[128] | N/A | Bangladesh | Cross-sectional study | Quantitative | Access to, and availability of, healthcare services | Variability in traffic congestion |
| | Madan (2019)[87] | Female slum residents | India | Cross-sectional study | Qualitative | Access to primary care | Long waiting times and opening times of the primary health care; quality of services; satisfaction with treatments; home remedies; cost; rude attitude of healthcare providers |
| | Owiti (2018)[86] | Pregnant women in slums | Kenya | Cross-sectional | Quantitative | Utilisation of maternal health | Perception about public health facility delivery; living within |

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| | | | study | | services in public health facilities | close proximity; waiting time at the facility; learning about the program; quality of service; ANC attendance at a private and a non-profit health facility |
| Castiglione (2018)[112] | Slum residents | Brazil | Cross-sectional study | Qualitative | Barrier to healthcare seeking | *Public healthcare services:* structural aspects of the healthcare system in their community as a whole, such as scarcity of personnel and equipment, or long waiting periods; experiences of conflict when dealing with doctors and other professionals of the public healthcare system<br><br>*Private healthcare services*: Insufficient funds to seek assistance; services or products in the private sector; |
| Tabrizi* (2018)[114] | Households in slum and non-slums | Iran | Cross-sectional study | Quantitative | Utilisation of health services | High cost of services |
| | | | | | Home care services | High cost of services |
| | | | | | Not taking drugs prescribed | Slums:<br>financial problems<br><br>Non-slums:<br>getting better/feeling well |
| Wairiuko (2017)[88] | Elderly in slums | Kenya | Cross-sectional study | Mixed-method | Health service utilisation | Family support; satisfaction with healthcare services; gender healthcare worker preference; services by community health worker |
| Owusu-Ansah (2016)[83] | Slum residents | Ghana | Cross-sectional study | Qualitative | Utilization of healthcare | Education; occupation; NHIS membership; knowledge of symptom; overall knowledge |

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| | | | | | | score; transportation |
| Adane (2017)[81] | Mothers/caregivers of under-five children in slums | Ethiopia | Cross-sectional study | Quantitative | Utilization of healthcare facilities in children with diarrhoea | Mothers/caregivers education; occupation; time of walking to the nearest health facility; household monthly income; recognized danger signs |
| MacPherson (2019)[124] | Slum residents | Malawi | Prospective study | Quantitative | Access to TB diagnosis | Distance to the nearest TB registration clinic |
| Wingfield (2017)[122] | Slum households with patients treated for TB | Peru | Randomized controlled study | Quantitative | Initiation of TB preventive therapy | Socioeconomic support and social support |
| Iberico (2016)[99] | Healthcare workers and community members in slums | Peru | Cross-sectional study | Qualitative | Utilization of preventive therapy | Misunderstanding and fear of treatment |
| Snyder* (2016) [52] | TB patients living in slum and non-slum | Brazil | Retrospective study | Quantitative | Abandonment of TB treatment | Residency in a slum; sex; age; extrapulmonary clinical disease; HIV/AIDS; interaction (directly observed treatment × residency in a slum) |
| Oluoch (2017)[97] | Slum residents | Nairobi | Cross-sectional study | Quantitative | Attendance to HIV testing and counselling services | Previous test experience |
| Martinez Perez (2016)[89] | Healthcare workers and community members in slums | South Africa | Cross-sectional study | Mixed method | HIV Counselling and Testing | Fear; lack of trust |
| Amiresmaili (2019)[18] | Slum residents | India | Cross-sectional study | Quantitative | Utilisation of outpatients services | Gender; marital status |
| | | | | | Utilisation of inpatients services | Age of household head; marital status; insurance |
| Horng (2019)[49] | Slum households with children under 5 years old who either recently | Bangladesh | Cross-sectional study | Quantitative | Healthcare utilisation in severe acute respiratory illness | Relocation; age of child; education of mother; household wealth; health service knowledge |

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| | | relocated <12 months or who were residentially stable living >24 months | | | | Full vaccination coverage | Relocation; number of children in household; age of child; education of mother; occupation of household head; household wealth; health service knowledge |
| | Kuria (2018)[132] | Patients received hypertension treatment in slums | Kenya | Retrospective study | Quantitative | Compliance in hypertensive treatment | Health facility group than walkway or weekend clinic attenders |
| | Cernauskas (2018)[125] | Slum residents | India | Cross-sectional study | Quantitative | Health provider choice | Distance to health facilities; friendly attitude of healthcare workers; appropriate service; familiarity |
| | Kaba (2020)[74] | Stakeholders (community members, community opinion leaders, health professionals, health office representatives.) | Ethiopia | Cross-sectional study | Qualitative | Utilisation of health services | Individual level: awareness about health problems; competing priorities; capacity to pay for services when referred. |
| | Mataboge (2016)[133] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Healthcare utilisation | Long waiting time |
| Immunisation | **Muhammad (2021)[129]** | **Caregivers of children, community influencers, immunisation staff in peri-urban slums** | **Pakistan** | **Cross-sectional study** | **Mixed-method** | **Childhood vaccination** | **Permission for immunisation by decision-maker; lack of knowledge and awareness of the benefit of immunisation; misconceptions and fears regarding vaccines; social and religious barriers** |
| | **de Araujo Veras (2020)[45]** | **Children in slums** | **Brazil** | **Cross-sectional study** | **Quantitative** | **Childhood vaccination** | **Age of child: mother's education** |

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| **Mutua (2020)[106]** | **Children in slums** | **Nairobi** | **Prospective study** | **Quantitative** | **Full and on-time vaccination coverage** | **Place of residence; wealth** |
| **Roja (2020)[44]** | **Mothers of children in slums** | **India** | **Cross-sectional study** | **Quantitative** | **Immunisation status of children** | **Number of children in family; age of child; father's education** |
| Obanewa (2020)[60] | Rural/urban formal/slum residents | Nigeria | Retrospective cross-sectional study | Quantitative | Fully-immunised child coverage | For slums: delivery place; maternal education; birth order; antenatal attendance; religion<br><br>For slum and non-slums: year; birth order; antenatal attendance; maternal education; religion; maternal age at child's birth; media exposure; region of the country; interaction between place of residence and place of delivery |
| Viramgami (2019)[119] | Married slum residents in reproductive age | India | Cross-sectional study | Quantitative | Vaccination status of child | Mother's employment |
| Singh (2018)[68] | N/A | India | Literature review | - | Childhood vaccination | Fear of adverse events; lack of information/knowledge; disease not harmful/serious; parents busy; income; mother's education; travel/transfer/migration; unawareness of need for health services; faith in immunisation; mother ill; forgetfulness; lack of initiative; family problems; services not available/lack of facility; shortages/reluctant to open 10 dose vials for 1 or 2 infants; current/history of sickness lead to withhold the vaccine |

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| Pugliese-Garcia (2018)[76] | Stakeholders including slum residents, healthcare workers, health committee members, vaccinators | Zambia | Cross-sectional study | Qualitative | Vaccine hesitancy | Traditional remedies; alcohol use; religious beliefs; distrust towards western medicine; previous adverse events; fear of injections and low perceived need for immunisation; limited understanding of how vaccines work; overlapping local terms for vaccine; pain; perceived risk of infection |
| Manandhar (2018)[93] | Slum household with children age of 12-60 months | Nepal | Cross-sectional study | Quantitative | Incomplete immunisation | Knowledge on immunisation schedule |
| Dasgupta (2018)[116] | Slum household with children aged 0-59 months, resides in the study area for the past 12 months | India | Cross-sectional study | Quantitative | Vaccine hesitancy | Family type; education of mother |
| Lae (2018)[50] | Caregivers in slums | Myanmar | Cross-sectional study | Qualitative | Utilisation of immunisation services | Age of child; income; migration; antenatal visit; receiving additional vaccines before; having immunisation card. |
| Schultz (2017)[126] | Parents with children <5 years old in slums | Kenya | Prospective study | Quantitative | Timeliness of vaccination | Close to the clinic; birth in December |
| Crocker-Buque (2017)[21] | People living in a low-income urban area or slum in a low-middle income countries | Multiple nations | Systematic review | - | Immunisation coverage | *Socioeconomic and demographic characteristics:* socioeconomic status; wealth; parents' literacy; mother's education; employment; residential status; place of residence; place of delivery; household visit by health workers; premature birth; malnourishment; inadequate housing; poor |

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| | | | | | | prenatal care; ethnicity; age; maternal age; birth order; sex of child; number of children<br><br>*Migration status:*<br>migration; recent migration<br><br>*Information, beliefs and behaviour:*<br>unaware of the need for vaccines; unaware of clinic location or timing; maternal knowledge of immunisation; lack of access to information; parents being too busy; return to home village; difficulty in accessing services; fear of side effects; attitude of health workers; concerns over cost; being suspicious of free services<br><br>*Health services:*<br>distance from health centre; timing of services; fear of costs; risk of lost income; lack of local knowledge; patients' satisfaction; provision of accurate information; accessing pre-natal care |
| Shrestha (2016)[82] | Slum households with children aged 12–23 months. | Nepal | Case-control study | Quantitative | Incompletion of immunisations. | Home delivery; type of residence; knowledge about healthcare services of primary care-taker; perception towards healthcare services, conflicting priorities, side effect |
| Devasenapathy (2016)[57] | Slum household with children aged between 12 and 42 months | India | Cross-sectional study | Quantitative | Childhood complete immunisation | Sex; mother's literacy; place of birth; place of childbirth; religion; socioeconomic position; birth certificate |

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| Maternal | **Sendo (2021)[92]** | **Female slum residents** | **Ethiopia** | **Cross-sectional study** | **Qualitative** | **Delivery in healthcare facilities** | **Provision of quality, respectful and dignified midwifery care; lack of awareness about facility delivery.** |
| | **Kardalkar (2020)[135]** | **Female delivered within three months in slums** | **India** | **Cross-sectional study** | **Quantitative** | **Utilization of antenatal care** | **Literacy; Gravida; occupation** |
| | **Sendo (2020)[91]** | **Women of reproductive age in slums** | **Ethiopia** | **Cross-sectional study** | **Qualitative** | **Delivery in facilities** | **Perceived benefits of home delivery; knowledge deficit about health facility-based delivery; poor access to healthcare facilities; inadequate resources** |
| | **Sharma (2020)[127]** | **Women delivered a baby within one year in slums** | **India** | **Cross-sectional study** | **Quantitative** | **Utilization of maternal healthcare services** | **Education; employment of mother; category and type of family; distance and time to reach health facility;** |
| | **Yadav (2020)[42]** | **Married women in slums** | **India** | **Cross-sectional study** | **Quantitative** | **Unmet need for family planning services** | **Age; educational status; duration of marriage; number of pregnancies; knowledge of contraceptive methods; opposition to contraceptive use; contact with a midwife** |
| | Razzaque (2020)[66] | Slum residents | Bangladeshi | Cross-sectional study | Quantitative | Healthcare utilisation | Recent migration; wealth; education; employment |
| | Getachew (2020)[113] | Slum households | Ethiopia | Cross-sectional study | Quantitative | Delivery in healthcare facilities | Perceived as not customary to deliver at health facility; not necessary; unavailability of female birth attendants; perceived quality of services; cost |
| | Shrestha (2019)[61] | Mothers with infant residing in slums | Nepal | Cross-sectional study | Quantitative | Utilisation of antenatal and delivery services | Educational status of respondents and their husbands; number of pregnancy |

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| | | | | | Institutional delivery | Educational status; occupation of husband; number of pregnancy |
| | | | | | Postnatal visit | Occupation of husband |
| | | | | | Utilisation of family planning services | Occupation of husband |
| | | | | | Tetanus Toxoid immunisation | Educational status of respondents; economic status; knowledge about healthcare services; educational status of husband; number of pregnancies |
| Atusiimire (2019)[98] | Mothers delivered in the past one year in slums | Uganda | Cross-sectional study | Quantitative | Facility based deliveries | Exposure to media concerning facility delivery; frequency of ANC; timing of 1st ANC |
| Upadhyai (2019)[39] | Recently delivered mothers residing in slums | India | Cross-sectional study | Quantitative | Healthcare utilisation | Age; education of mother and father; socioeconomic class; antenatal check-ups; institutional delivery services; family type; caesarean delivery; complication or perceived health problem |
| Angeles* (2019)[47] | Slum and non-slum residents | Bangladesh | Prospective study | Quantitative | Use of modern contraceptive methods | Parity, mother's age; mother's education, socioeconomic status, interaction (slum × time period) |
| | | | | | Delivery by skilled birth attendant | Residing in slums, parity, mother's age, mother's education, length of stay in current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Kusuma (2018)[80] | Recent migrant and settled mothers with a | India | Cross-sectional study | Quantitative | Birth in health facility | Listening to radio; number of ANC visits; plan for hospital birth; plan for transport; some |

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| | child up to the age of 1 year in slums | | | | | danger sign; knowledge of danger sign |
| Sharma (2018)[138] | Women living in urban slums and delivered a baby within 1 year | India | Cross-sectional study | Quantitative | Utilisation of maternal care services | Mode of delivery; hospital stay after delivery |
| Islam* (2018) [107] | Ever-married women aged 15-49 years living in slum and non-slum | Bangladesh | Cross-sectional study | Quantitative | ANC visits | Education; wealth index of the household |
| Geddam (2017)[67] | Rural to urban internal migrant mothers with a child of less than 2 years of age | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education of the mother; family size; occupation of mother |
| | | | | | Delivery in institution | Educational status of mother; number of ANC visit; adequacy of ANC; migration status |
| Kaba (2017)[94] | Stakeholders including city administrators, community members, healthcare providers | Ethiopia | Cross-sectional study | Qualitative | Maternal health service utilisation | Lack of awareness and lack of perceived needs about available services; fear of stigma; competing priorities, social connectedness; perceived lack of respectful service providers; socio-cultural factors including socially sanctioned expectations |
| Verma (2017)[75] | Pregnant women and infants in slums | India | Case-control study | Mixed-method | Antenatal care registration/immunisation | Knowledge of healthcare services; perceived need for healthcare services; family support; fear; negative experience with previous vaccination |
| Sharma (2016)[51] | Married women in slums | Nepal | Cross-sectional study | Quantitative | Antenatal healthcare utilisation | Age; husband education; spouse occupation; family income; type of family; planned pregnancy; death of children |
| Jolly (2016)[108] | Married women with a pregnancy outcome in the previous year in | Bangladesh | Cross-sectional study | Quantitative | Antenatal care; birth assisted by medically trained provider; postnata | Education; wealth |

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| | | slums | | | | care; treatment seeking for delivery complications | |
| | | | | | | Use of modern family planning | Wealth |
| | Tebekaw (2016)[117] | Women in slums | Ethiopia | Cross-sectional study | Quantitative | Antenatal care services | Education; private/public hospital |
| | Sadhna (2016)[109] | Married women in slums | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education; Caste; wealth; distance to preferred health facility |
| | Neyaz (2016)[62] | Married women in slums | India | Cross-sectional study | Quantitative | Delivery in hospitals | Received ANC; number of ANC visits; education; birth order; living index |
| | Rahman (2016)[105] | Married women in rural and slum area | India | Cross-sectional study | Quantitative | Intrauterine contraceptive device utilisation | Income; occupation |
| | Sheehy (2016)[103] | Informant and women in slums | Myanmar | Cross-sectional study | Qualitative | Giving birth in hospital | Financial constraints; lack of transportation; sociocultural and financial considerations |
| Contraceptive | Renzaho (2017)[48] | Slum residents aged 13-24 | Uganda | Cross-sectional study | Quantitative | Access to contraceptive services and family planning | Age; disability |
| | Abd El Fatah (2019)[136] | Married women aged 15–49 years in slums | Egypt | Cross-sectional study | Quantitative | Contraceptive use | Number of male children |
| Health insurance | **Iyalomhe (2021)[41]** | **Slum residents** | **Nigeria** | **Cross-sectional study** | **Quantitative** | **Healthcare insurance coverage** | **Age; sex; marriage; income; religion; education** |
| | **Mendhe (2021)[40]** | **Female slum residens** | **India** | **Cross-sectional study** | **Quantitative** | **Healthcare insurance coverage** | **Socioeconomic status;** |
| | | | | | | **Out of pocket expenditure** | **Age; government/ private hospital** |
| | Otieno (2019)[84] | Slum residents | Kenya | Cross-sectional | Quantitative | Enrolment in a health insurance | Employment; source of primary care; satisfaction with cost of |

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| | | | | study | | programme | care; satisfaction with procedure of care; perceived health status |
| | Kusuma (2018)[69] | Slum residents | India | Cross-sectional study | Quantitative | Health insurance possession | Residential background (old slums than new); migration period; possession of ration card; household size; occupation of household head |
| | Gupta (2017)[95] | Slum households having health insurance cards | India | Cross-sectional study | Mixed-method | Utilisation of healthcare insurance | Awareness of the empanelled hospitals; experiences of friends and relatives at national health insurance empanelled hospitals; hospitals refused to accept health insurance cards |
| Expenditure | Sahu (2017)[63] | Women delivered within a period of 6 weeks in slums | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure for maternal and neonatal health services | Gravidity; type of delivery; place of delivery; morbidity |
| | Mishra (2017)[59] | Slum households with a child aged 0–14 years and who had migrated within the last 12 years | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure | Child's gender; mother's education; type of illness |

*Factors reported in the study were associated with participants covering both slum and non-slum residents. ANC: antenatal care; CVD: cardiovascular disease; HIV: human immunodeficiency virus; N/A: not applicable; NGO: non-governmental organization; TB: tuberculosis.

Supplement 3. Provision of healthcare services in slums examined by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General provision | **Banerjee (2021)[145]** | **Community-level service providers in the selected city of Nagpur, Maharashtra.** | **India** | **Cross-sectional study** | **Mixed-methods** | **Implementing urban health and nutrition day** | **Unserved areas and left-out urban slum pockets; the distribution paradox of Urban Health and Nutrition Day location with an ill-defined geographic boundary; restriction of range of services to antenatal registration and immunisation with gross neglect of other components; suboptimal training of staff; insufficient availability of space, logistics, and health manpower; non-involvement of community members and Urban Local Bodies; and poor monitoring and supervision.** |
| | **Muhammad (2021)[129]** | **Caregivers of children, community influencers, immunisation staff in peri-urban slums** | **Pakistan** | **Cross-sectional study** | **Mixed-method** | **Childhood vaccination** | **Underperformance of staff; unreliable immunisation and household data; inefficient utilization of funds; interference of polio campaigns with immunisation** |
| | Kaba (2020)[74] | Stakeholders (community members, community opinion leaders, Urban Health Extension | Ethiopia | Cross-sectional study | Qualitative | Provision of health services | Institutional-level: medical supplies; a lack of passion; attitudes on the part of health service providers<br><br>Community level: |

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| | Professionals, and city health office representatives.) | | | | | shared understanding of the problems; services and the community's established values in relation to the problems and services. |
| Das Gupta (2020)[143] | N/A | India | Case study | Mixed-method | Improving public health services | Devolution of service delivery transferring funds and responsibilities to elected local bodies; management by professional managerial and technical cadres; Tight organisation of public health services; Professional support from the state directorate of public health |
| Ongarora (2019)[146] | Private healthcare facilities | Kenya | Cross-sectional study | Quantitative | Provision of medicine | Medicine price, affordability and availability of medicine |
| Agonigi (2018)[142] | Health professionals | Brazil | Cross-sectional study | Qualitative | Production of care in the daily work of health professionals | Issues related to assignment of tasks; inadequate space and equipment; requirement to follow standardised protocol; demands from the management; workload; environment (sanitation, territory); violence; registration |
| Odhiambo (2016)[140] | Community health workers | Kenya | Longitudinal study | Quantitative | Drug administration activities for schistosomiasis | Community health worker familiarity with households led to warm reception; good knowledge of intervention area by community health workers; high demand for drugs in the final year of treatment; effective community mobilization; opportunity to integrate mass drug administration with other health interventions; presence of community health workers and their supervisory structure, and points of referral for serious side |

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| | | | | | | effects; fear of side effects, size of tablet and misconceptions regarding treatment; unrelated death and the associated negative publicity by the media; religious beliefs and mistrust of interventions; insufficient time; absence of community members during the drug administration exercise; difficulty in directly observing treatment; unsanitary environmental conditions; inaccessibility (filthy and bush environment); demand for incentives by community members to take drugs. |
| Patil (2016)[141] | Healthcare service centres | India | Cross-sectional study | Quantitative | Services provided under Integrated Child Development Services | Lack of basic infrastructural facilities; absence of essential drugs, equipment and logistics; poor pay scale, untimely drug supply, poor community support, more of documentation work, increased work burden, lack of supportive staff and no incentives for the increased work |
| Mataboge (2016)[133] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Provision of reproductive healthcare services | Healthcare policies; work overload; community-based care |
| Prado Junior (2016)[144] | New TB cases living in slum and non-slum | Brazil | Cross-sectional study | Quantitative | Coverage under Family Health system for TB patients | Policy prioritizing low social development areas |

TB: tuberculosis

Appendix 1. Search strategy and the result of each database.

| Database | Search strategy | Number of studies |
|---|---|---|
| Ovid Medline | 1. (informal* and settlement*).ti,ab,kw.<br>2. (shanty and town*).ti,ab,kw.<br>3. (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4. or/1-3<br>5. limit 4 to english language | **4,688** |
| Embase | 1 (informal* and settlement*).ti,ab,kw.<br>2 (shanty and town*).ti,ab,kw.<br>3 (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4 or/1-3<br>5 limit 4 to english language | **5,090** |
| Web of Science | 1 (TS=(favela* OR ghetto* OR shantytown* OR shanty-town* OR slum OR slums)) AND language: (English)<br>2 ((TS=(informal* NEAR settlement*))) AND language: (English)<br>3 (TS=(shanty NEAR town*)) AND language: (English)<br>4 (#1 OR #2 OR #3) AND language: (English) | **3,553** |
| Cochrane | 1 (informal* and settlement*).ti,ab,kw.<br>2 (shanty and town*).ti,ab,kw.<br>3 (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4 #1 or #2 or #3 | **381** |
| CINAHL | 1 TI ( informal* and settlement* ) OR AB ( informal* and settlement* )<br>2 TI ( shanty and town* ) OR AB ( shanty and town* )<br>3 TI ( favela* or ghetto* or shantytown* or shanty-town* or slum or slums ) OR AB ( favela* or ghetto* or shantytown* or shanty-town* or slum or slums )<br>S1 OR S2 OR S3 | **1,757** |

## Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| **TITLE** | | | |
| Title | 1 | Identify the report as a scoping review. | 1 |
| **ABSTRACT** | | | |
| Structured summary | 2 | Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives. | 2 |
| **INTRODUCTION** | | | |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach. | 4 |
| Objectives | 4 | Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives. | 5 |
| **METHODS** | | | |
| Protocol and registration | 5 | Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number. | 5 |
| Eligibility criteria | 6 | Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale. | 6-7 |
| Information sources* | 7 | Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed. | 5-6 |
| Search | 8 | Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated. | 5-6, appendix1 |
| Selection of sources of evidence† | 9 | State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review. | 5-7 |
| Data charting process‡ | 10 | Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators. | 7-9 |
| Data items | 11 | List and define all variables for which data were sought and any assumptions and simplifications made. | 7-9 |
| Critical appraisal of individual sources of evidence§ | 12 | If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate). | N/A |

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| Synthesis of results | 13 | Describe the methods of handling and summarizing the data that were charted. | 7-9 |
| **RESULTS** | | | |
| Selection of sources of evidence | 14 | Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram. | 10-11, Figure 1 |
| Characteristics of sources of evidence | 15 | For each source of evidence, present characteristics for which data were charted and provide the citations. | Supplement 1-3 |
| Critical appraisal within sources of evidence | 16 | If done, present data on critical appraisal of included sources of evidence (see item 12). | N/A |
| Results of individual sources of evidence | 17 | For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives. | Table 2-3 |
| Synthesis of results | 18 | Summarize and/or present the charting results as they relate to the review questions and objectives. | 13-25, Figure 2 |
| **DISCUSSION** | | | |
| Summary of evidence | 19 | Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups. | 29-30 |
| Limitations | 20 | Discuss the limitations of the scoping review process. | 31 |
| Conclusions | 21 | Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps. | 34 |
| **FUNDING** | | | |
| Funding | 22 | Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review. | 35-36 |

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

*From:* Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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# Factors associated with accessing and utilisation of health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature

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# Factors associated with accessing and utilisation of health care and provision of health services for residents of slums in low and middle income countries: a scoping review of recent literature

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## ABSTRACT

**Objective**: To identify factors associated with accessing and utilisation of healthcare and provision of health services in slums.

**Design:** A scoping review incorporating a conceptual framework for configuring reported factors.

**Data sources:** MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library were searched from their inception to December 2021 using slum related terms.

**Eligibility criteria:** Empirical studies of all designs reporting relevant factors in slums in low and middle income countries.

**Data extraction and synthesis:** Studies were categorised and data were charted according **to** a preliminary conceptual framework refined by emerging findings. Results were tabulated and narratively summarised.

**Results:** Of the 15,091 records retrieved from all years, 4,368 records dated between 2016-2021 were screened by two independent reviewers and 111 studies were included. The majority (63 studies, 57%) were conducted in Asia, predominantly in India. In total 104 studies examined healthcare access and utilisation from slum residents' perspective while only ten studies explored provision of health services from providers/planners' perspective (three studies included both). A multitude of factors are associated with accessing, utilising and providing healthcare in slums, including recent migration to slums; knowledge, perception and past experience of illness, healthcare needs and health services; financial constraint and competing priorities between health and making a living; lacking social support; unfavourable physical environment and locality; sociocultural expectations and stigma; lack of official recognition; and existing problems in the health system.

**Conclusion:** The scoping review identified a significant body of recent literature reporting

factors associated with accessing, utilisation and provision of healthcare services in slums. We classified the diverse factors under seven broad categories. The findings can inform a holistic approach to improving health services in slums by tackling barriers at different levels, taking into account local context and geospatial features of individual slums.

**Systematic review registration:** Open Science Framework (OSF, https://osf.io/694t2)

**Keywords:** slum, informal settlement, scoping review, healthcare-seeking behaviour, healthcare utilisation, health service delivery

Strengths and limitations of this study

- We conducted literature search in multiple databases using generic terms related to slums to ensure that a wide range of relevant studies was captured.
- A conceptual framework explaining factors associated with accessing and utilisation of healthcare by slum residents as well as provision of healthcare in slums was developed and used to categorise identified studies and factors.
- We examined barriers and facilitators of accessing healthcare and service provision from the perspectives of both demand side (slum residents) and supply side (healthcare providers and service planners).
- Only studies published in academic journals between 2016 and 2021 in English language were included, and methodological quality of each included study was not examined because of time constraint.
- We did not explore the complex relationships and interactions between various factors in different contexts at different slum locations, but our mapping of these factors to the conceptual framework should facilitate further in-depth analyses.

# INTRODUCTION

Rapid urbanisation has resulted in a growing number of residents in slums [1] who face ongoing problems such as unemployment, poor sanitation, lack of transport, high level of crime, and haphazard development [2]. In 2018, over one billion people were living in slum-like conditions, and Central, South and South-East Asia and Sub-Saharan Africa accounted for 80% of them [1]. Even though various definitions of slums exist, there is no universally agreed definition of what constitutes 'a slum', and the term itself is widely debated and contested [3, 4]. For the purpose of this scoping review, we refer to slums as densely populated areas characterised by lack of basic services, substandard housing, overcrowding, unhealthy living condition, insecure tenure and poverty [4, 5], taking into account the crucial concepts of place and space that are important in shaping health outcomes and community access to health services in these urban settings [4].

Previous studies have reported various risk factors affecting health of slum residents such as physical environment [6], sanitation [7], social capital [8, 9] and water governance [10], and have observed in some cases that slum residents have worse health status compared to non-slum urban and/or rural residents. For example, Ezeh et al. found that children living in slums had higher mortality than rural and non-slum urban populations [3]. Poorer height-for-age for children [11] and higher prevalence of childhood illnesses and malnutrition [12] have also been observed in slums compared to non-slum urban and rural settings. In addition, slum residents are susceptible to unhealthy behaviours [13, 14]. Living in slums has been found to be associated with low physical activity [13], poor diet [14], and poor knowledge about the cause and preventability of diseases [15].

Despite the unfavourable health status and environment, and consequently the potential high level of healthcare needs, previous studies showed that slum residents were less likely to seek

and use healthcare services than their non-slum counterparts in the cities [16, 17]. Slum residents have been found to have lower rates of healthcare utilisation in antenatal services [16] and services for non-communicable diseases [17] compared to residents of urban 'formal' settings. One study in Iran showed that only about half of slum households that required outpatient services could use them [18]. Another study in Haiti also reported that one third of slum households were not able to access medical care for their children when it was needed in the past year [19].

While the health status and needs of slum residents have been described in previous reviews [3, 20], factors associated with healthcare seeking behaviour and healthcare utilisation of slum residents and factors related to the provision of health services in slums have not been systematically examined (with the exception of immunisation services) [21]. This scoping review aims to fill in these evidence gaps and inform efforts to improve healthcare delivery to people in slums.

## METHODS

This scoping review was performed according to current best practice guidance [22]. The broad question of interest was: "*What factors are associated with slum residents' **accessing and utilisation** of health care and/or the provision of health services in slum settings in low and middle income countries (LMICs)*?" The protocol for this review was registered in Open Science Framework (OSF) [23].

### Literature search and study selection

A broad search of five databases (MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Library) was conducted in April 2020 and updated in December 2021. Searches were limited to English language. Key terms related to slums were used: slum or slums or ghetto or ghettos or informal settlement$ or shantytown$ or shanty town$ or favela$. (Appendix 1) We did not include terms related to other concepts in order to maximise the sensitivity of our searches. In addition, we searched organizational websites of Slum Dwellers International, UN HABITAT, UN and WHO but did not identify relevant studies [24-27].

Records retrieved from databases (after duplicates were removed) were initially screened by one reviewer (JEP) and those which did not meet the inclusion criteria were disregarded. After that, a second reviewer (PK, GY, OO) examined the remaining records independently based on titles and abstracts. When the decisions of two reviewers differed, the discrepancy was resolved based on full-texts and/or by discussion with a third reviewer (YFC) or the broader review team. This study screening process started from records of the most recent years (i.e. in the past three years) and then proceeded to prior years. Due to the larger than expected volume of the literature, we eventually screened records between 2016 to 2021 and did not cover earlier records in order to synthesise and present the findings from latest evidence in a timely fashion to inform the wider project hosting this review [28, 29].

**Inclusion and exclusion criteria**

A study was included when it: (1) described factors related to slum residents' accessing or utilisation of health care or the provision of health services in slums; and (2) was conducted in relation to slums in LMICs. Only articles written in English were included. A study was excluded when it was a commentary, opinion, or narrative review; described slum residents' utilisation of health services or the provision of health services without exploring the associated

factors; investigated informal care at home; or included mixed slum and non-slum populations without separately reporting data for slum residents or investigating residency in slums as a factor for healthcare access.

During our updated search in December 2021, we found several studies reporting healthcare utilisation [28] and provision related to COVID-19 in slums [30]. These studies were not included in this scoping review, since the factors associated with healthcare utilisation and health service provision under the pandemic situation are dramatically different and warrant a separate synthesis.

We included both primary studies and systematic reviews that examine data collected empirically and that derive their findings based on the data. Both quantitative and qualitative studies (and by extension, mixed methods studies) were considered. Even though slums have existed in both high-income countries and LMICs, the context may be quite different between these countries. For example, while all slums are vulnerable to natural disasters such as tropical cyclones, the impact of these could be far more severe in slums of LMICs due to the different socioeconomic contexts [31]. In this review, we focused on settings in LMICs and excluded studies conducted in high-income countries.

**Study coding and data extraction/charting**

Eligible studies were coded and data-extracted/charted according to a pre-specified, preliminary framework shown in Figure 1 below. The preliminary framework was developed by the review authors based on existing conceptual models related to healthcare access and service delivery [32-35] and was modified during the scoping review process to accommodate new factors/themes identified from the literature. The refined conceptual framework is shown in Figure 2.

Based on the refined conceptual framework, each eligible study was coded as being associated with one or more of the three phenomena of interest, namely slum residents' healthcare accessing (which covered perception of needs/desire for care, healthcare seeking and healthcare reaching as defined by Levesque et al [34]), health care utilisation and provision of health services (which covered various arrangements related to service delivery) in slum settings. (Figure 2)

In addition, to facilitate the organisation of complex evidence in this review, diverse factors reported in the included studies were initially classified into six different categories according to the preliminary framework shown in Figure 1. However, during the data charting process, we realised that many factors such as perception of symptoms and experience from past use of healthcare services did not fit into one of these six original categories. A new category of 'cognitive and experiential factors' was therefore added to the refined conceptual framework (Figure 2) to reflect the emerging themes, which include seven categories:

(1) Personal and biological factors: these relate to personal characteristics of slum residents, including age, sex, ethnicity and the nature and severity of health conditions.

(2) Cognitive and experiential factors: these relate to personal awareness, knowledge, perception, attitude, belief and experience etc. formed through cognitive process based on upbringing and past events.

(3) Socioeconomic factors: these include income and wealth, economic hardship/poverty and economic opportunities, marital status, education, crime, social capital (such as bonding, trust and reciprocity between close relatives, neighbours and community members) [36], use of technologies for social and economic purposes, commercial and charitable organisations and activities.

(4) Physical environment: this covers natural environment such as proximity to a health

facility, built environment and infrastructure such as water supply, transport and mobile/internet networks, as well as weather conditions and environmental pollutions.

(5) Cultural and religious factors: these include cultural and religious beliefs and activities, and local and national customs.

(6) Legal, political and policy factors: these include government policies and issues related to legal, justice and political systems.

(7) Health system factors: these relate to historical and current organisation and provision of health care that may impact upon provision and delivery of health services in individual slum communities and the services experienced by slum residents.

In addition to the addition of the 'cognitive and experiential factors' category, another major difference between the preliminary (Figure 1) and refined (Figure 2) conceptual framework relates to the definition of healthcare access. Our preliminary framework adopted the definition by Levesque and colleagues, who defined healthcare access as "the possibility to identify healthcare needs, to seek healthcare services, to reach the healthcare resources, to obtain or use health care services, and to actually be offered services appropriate to the needs for care." [34] However, during our study screening and data charting process, we found that it would be helpful to make a distinction between the process of 'accessing' healthcare (which covers gaining awareness of needs, forming an intention to seek healthcare and taking an action to reach healthcare) and the actual receipt and utilisation of health care ('accessed care') when examining empirical evidence, as healthcare needs could only be met when the latter occurs and this not only depends on factors related to service users (demand side) but also relies on factors related to service providers/planners (supply side). Therefore we separated out utilisation of health care from 'accessing health care' to highlight that it requires a match between demand and supply side factors.

Data on study population, study design, country in which the study was conducted, methodology, and associated factors were extracted using a data-charting spreadsheet which was developed and continuously updated as the review progressed by two of the reviewers (JEP and YFC). Whether a study was conducted exclusively within slums and whether a comparison was made between slum and non-slum urban or rural residents were also noted. Coding of phenomena and factors and data-charting were conducted by one reviewer (JEP) and checked by a second reviewer (PK, GY, OO, YFC). Disagreements were discussed between reviewers until consensus was reached.

### Patient and public involvement

Given the focus of this scoping review on published literature, we did not directly involve residents and service providers/planners from slum settings. Nevertheless, our wider project has a work package that specifically engages with slum residents and service providers and planners [28], and early plans and findings of this review were shared with the wider project team who provided comments based on their experiences of community engagement.

## RESULTS

The reporting of this review follows the PRISMA Extension for Scoping Reviews (PRISMA-ScR) [37]. Using the search strategy described earlier, a total of 15,091 records were retrieved from the initial and updated searches (Medline 4668, Embase 5090, Web of Science 3553, Cochrane 381, CINAHL 1575), with 9,916 records remaining after excluding duplicates. Two additional articles [18, 38] were identified from references of the included studies. As described earlier, screening was limited to the 4,368 records published from 2016 onwards.

A total of 111 articles were included in this scoping review. (Figure 3) Thirty-two studies reported factors associated with healthcare accessing of slum residents, 73 studies reported factors related to healthcare service utilisation, and 10 articles reported the factors related to provision of healthcare services in slums (four studies reported factors related to more than one phenomenon of interest). Seventy-four of the 111 studies were quantitative studies, 21 studies were qualitative studies, and 14 studies were undertaken using mixed-methods. The remaining two studies were systematic reviews. A total of 42 (38%) studies were conducted in India, followed by Kenya (14 studies, 13%). (Table 1)

Table 1. Characteristics of included studies.

| Category | Subcategory | | Number of studies (%) |
|---|---|---|---|
| Publication year | 2016 | | 22 (20) |
| | 2017 | | 17 (15) |
| | 2018 | | 23 (21) |
| | 2019 | | 22 (20) |
| | 2020 | | 18 (16) |
| | 2021 | | 9 ( 8) |
| Analysis method | Quantitative | | 74 (67) |
| | Qualitative | | 21 (19) |
| | Mixed-methods | | 14 (13) |
| | Narrative synthesis | | 2 ( 2) |
| Study location | Asia | India | 42 (38) |
| | | Bangladesh | 9 ( 8) |
| | | Nepal | 4 ( 4) |
| | | Pakistan | 3 ( 3) |
| | | Myanmar | 2 ( 2) |
| | | Iran | 2 ( 2) |
| | | Sri Lanka | 1 ( 1) |
| | South America | Brazil | 7 ( 6) |
| | | Peru | 2 ( 2) |
| | Africa | Kenya | 14 (13) |
| | | Ethiopia | 7 ( 6) |
| | | Malawi | 4 ( 4) |
| | | Uganda | 3 ( 3) |
| | | South Africa | 2 ( 2) |
| | | Sierra Leone | 1 ( 1) |
| | | Nigeria | 1 ( 1) |
| | | Egypt | 1 ( 1) |
| | | Zambia | 1 ( 1) |
| | | Namibia | 1 ( 1) |
| | | Ghana | 1 ( 1) |
| | North America | Haiti | 1 ( 1) |
| | Multiple nations | | 1 ( 1) |
| Healthcare services in slums* | Healthcare accessing | | 32 |
| | Healthcare service utilisation | | 73 |
| | Provision of healthcare services | | 10 |
| Total | | | 111 (100) |

* One study reported factors related to both healthcare accessing and healthcare utilisation and three studies reported factors related to both healthcare utilisation and provision of healthcare services

Participants, country, study design, methodology, observed phenomena and outcomes, and factors of interests for each study are described in supplemental tables 1-3. Supplemental table 1 shows 32 studies reporting factors associated with general healthcare seeking behaviours; healthcare seeking for children or women; slum residents' preference for healthcare providers; and healthcare seeking related to HIV testing. Supplemental table 2 presents various factors reported in 73 studies related to general healthcare utilisation as well as use of specific services such as childhood immunisation, maternal healthcare, and possession of health insurance. In Supplemental table 3, ten studies reporting factors related to the provision of health services in slums are summarised. Key findings are described below.

**Demand side: Factors associated with healthcare accessing and healthcare utilisation of slum residents**

We found 104 articles which identified many different factors affecting healthcare accessing and utilisation. These factors are often inter-related and exert their influence at different levels (e.g. from personal, family to community level) in different circumstances. We classified various factors into seven categories (Figure 2). Factors particularly relevant to slum settings and other commonly identified factors within each category are highlighted below.

Personal and biological factors: The common factors associated with healthcare accessing and utilisation included intrinsic factors such as age [21, 39-56], sex [18, 21, 41, 46, 52, 54, 56-59], and ethnicity [21], familial factors such as birth order of the sick child [21, 47, 60-62], as well as personal health and type of illness [46, 59], disability [48] and morbidity [21, 52, 63, 64] and the specific features of the health condition [53, 56, 65]. Slum residents are more like to seek healthcare services when sick children are younger [49, 50, 53, 56], but evidence on

the association between mother's age and child's vaccination was inconsistent [21, 39]. Healthcare seeking and utilisation were different by sex, but the association was context dependent. Several studies reported higher healthcare utilisation among female slum dwellers [18, 52, 56, 58], while other studies showed male children had higher vaccination coverage [57] and incurred more medical expenditure [59]. Major life events such as recent migration [21, 50, 66-68] and relocation [49] into slums tend to be associated with lower healthcare seeking and utilisation. Recency of migration to slums was also related to lower uptake of Rashtriya Swasthya Bima Yojana (RSBY), a national health insurance programme run by the Indian government for poor families [69]. People with specific symptoms (such as fever, tachypnea, persistent vomiting) [53, 56, 65], disability [48] and illnesses including chronic disease [21, 52, 54, 63, 64] tend to use healthcare services more. Although people with tobacco habit were less likely to participate in breast cancer screening, they were more likely to take part when they had family history of cancer or history of cancer screening [70]. Lower birth order of the child was associated with increased utilisation of hospitals for childbirth [21, 47, 60-62], while the use of family planning service [47] and out-of-pocket expenditure was higher in multigravida than primigravida [63].

Cognitive and experiential factors: these factors were not included in our initial conceptual framework but rather emerged inductively from our data. Consequently, their identification led us to revise the conceptual framework for this scoping review. A wide range of factors formed through cognitive processes and influenced by individual's upbringing, past experience and surrounding environment were reported to be associated with both healthcare-seeking and healthcare utilisation of slum residents. Perception [39, 51, 53, 68, 71-77], knowledge [53, 78-83] and experience of symptoms and illnesses [51] were commonly found to influence

healthcare seeking and utilisation. Mothers who experienced child death and subsequently planned pregnancy showed higher use of antenatal healthcare services [51]. When people perceived the symptom or disease to be serious they tend to seek healthcare services [53, 71, 73, 77]. Although lack of knowledge could be a barrier to accessing healthcare services [78, 79], one study showed caregivers with good knowledge of child danger signs were less likely to seek healthcare services timely [53]. People perceiving their health status as good showed lower odds of having insurance [84], but awareness and knowledge of health problems lead people to use healthcare services [39, 74, 76, 80, 81, 83]. Home remedy and home management delayed healthcare seeking behavior [53, 71, 82, 85]. In addition, perception [21, 42, 64, 76, 84, 86-90], knowledge [21, 42, 49, 61, 68, 75, 82, 86, 91-96], and experience of healthcare services [39, 50, 60, 62, 67, 70, 75, 80, 87, 97, 98] including fear and distrust of healthcare services [21, 38, 68, 72, 75, 76, 79, 89, 99-101], and preference related to care provider's gender [88, 102] were frequently cited factors. Provider shopping associated with distrust of healthcare providers and denial of diagnosis delayed first care seeking and treatment initiation of pulmonary tuberculosis patients in India [71]. Perception or experience of healthcare services also affected uptake or renewal of health insurance [84, 95].

Socioeconomic factors: Socioeconomic status was associated with utilisation of healthcare services [21, 39, 40, 47, 57, 62, 82, 103], and even though one study showed that slum residents of lower socioeconomic class were more likely to enrol in health insurance than slum residents of higher socioeconomic class [40], the latter were more likely to use healthcare services [39, 47, 57, 62]. One study reported higher public hospital visits (compared with private hospital visits) among lower socioeconomic status [104]. Income and wealth [21, 41, 49-51, 61, 66, 68, 81, 105-109] including financial constraint [19, 21, 38, 46, 74, 77, 79, 85, 87, 90, 101, 103,

110-114] featured prominently. Higher education level [39, 49, 56-59, 61, 62, 66-68, 70, 81-83, 107-109, 115-117] and higher income [21, 49-51, 56, 58, 61, 66, 68, 81, 105, 107-109, 118] were associated with more seeking and utilisation of healthcare services. With some exceptions [67, 105], previous studies reported that employed slum residents tend to seek and use healthcare services more frequently than unemployed slum residents and housewives [49, 51, 66, 67, 70, 81, 83, 84, 119]. Even though married people tend to seek and use more healthcare services [18, 70], the reported influence of family type was inconsistent [39, 51, 116]. Female slum residents in nuclear family used more antenatal services than those in joint family type [51], but female in joint family type used more postnatal service [39] and immunisation service for their children [116]. Smaller family size used more maternal healthcare services [67], and bigger households had higher odds of having health insurance [69]. The socioeconomic challenges faced by slum residents also manifested as competing priorities [74, 94, 120] and lack of time [21, 101, 121] for healthcare-seeking and utilisation, because they did not want to or could not afford to miss work and lose income [21, 71], which can be exacerbated by lack of social support [75, 77, 88, 94, 100, 122].

Physical environment: Slum residents considered proximity of healthcare facilities [21, 38, 47, 77, 81, 85, 86, 96, 109, 123-127], transport such as travel assistance [77], lack of transportation [38, 83, 103], traffic congestion [128], and environment of residence area when they sought and used healthcare services. Long distance from health facility [38, 55, 77, 85, 102, 123], no transportation or travel assistance [38, 83, 103], unsafe environment of residential area such as darkness at night were reported as barriers to reaching healthcare facilities [100].

Cultural and religious factors: these included religion [41, 57, 60, 70, 76, 115, 129];

sociocultural influence [94, 102] such as exposure to media [80, 98]; stigma associated with unplanned/extramarital pregnancy [79, 94], postpartum depression [130] and other illnesses such as contagious skin disease, barrenness and female sexually-related problems [102]; and use of traditional/home medicine [76, 87, 100]. Women in slums could not go to hospital because they had difficulties in disclosing the symptoms, postponed their health issues because of their responsibilities at home, and engaged in self-treatment practices such as home remedies recommended by grandmother and friends because of socio-cultural influences toward healthcare-seeking behaviour [78]. Women in Ethiopia reported not returning to postnatal care due to religious and cultural expectation for mother and baby to stay home for 80 days after birth [94]. One Indian survey showed that some women could not seek healthcare services during labour since their husband or family did not allow that [38].

Legal, political and policy factors: type of slums (in terms of official recognition and availability of basic facilities) and possession of a ration card were found to be associated with uptake of the Indian RSBY national health insurance programme [69]. One study reported that slum residents could not seek healthcare facilities for abortion because of the perceived illegality of abortion [79].

Health system factors: slum residents were also influenced by many factors related to health systems when they sought healthcare. These included accessibility associated with the location [21, 102] and timing of services [21, 85, 87]; quality of healthcare services [38, 67, 86, 87, 102, 113, 125] such as delay in advising patients to go for related tests or referral [71], likelihood of receiving appropriate examination [85, 110], and adverse events [76]. Slum residents considered service organisation including medical turnover [131], availability of supplies/healthcare workers [47, 85, 110, 113], attitude of healthcare providers [87], type of healthcare facilities [38, 86, 117, 132], and waiting time [73, 85-87, 110, 112, 133]. Slum

residents tend to seek government and non-governmental organisation (NGO) facility [118] and avoid private hospitals [38] for healthcare services. Healthcare utilisation was higher among slum residents with healthcare insurance than those without it [18, 83], and households with higher quarterly out-of-pocket healthcare expenditure had lower scores for an index of access to primary health care [134].

In an Ethiopian study, some participants reported unavailability of female birth attendants as a reason for not delivering at healthcare facilities [113]. (Table 2)

Table 2. Factors associated with healthcare accessing and healthcare utilisation in slums from service user's (demand side) perspective.

| Factors | Healthcare accessing | Healthcare utilisation |
|---|---|---|
| Personal and biological factors | | |
| Age | (-) Age [53-56] | (±) Age [21, 39-52]; (+) age of household head [18] |
| Gender | (±) Sex [54, 56, 58, 59] | (±) Sex [18, 21, 41, 46, 52, 57, 59]; (male) sex of household head [134] |
| Ethnicity | | Ethnicity [21] |
| Migration | | (-) Recent migration [21, 50, 66-69]; (-) relocation [49]; (-) return to home village [21] |
| Biological | (+) Symptoms such as fever, tachypnea, chest in drawing, persistent vomiting [53, 56, 65]; having disease [54] | Type of illness [46, 59]; (+) having a disability [48]; (+) morbidity [21, 52, 63, 64] |
| Other personal | (-) Tobacco habits [70]; (+) family history of cancer and history of cancer screening [70] | (-) Birth order of sick child [21, 47, 60-62]; (-) parity [42, 47, 63, 135] |
| Cognitive and experiential factors | | |
| Knowledge/experience of symptoms and illnesses | (+) Perception of symptoms [71] or illness [53, 73, 77]; (±) knowledge of symptom/disease [53, 78, 79]; (-) denial and complacency [72] | (+) Experience of child death [51]; (+) planned pregnancy [51]; (+) perceived health status [84] and health problem [39, 74, 76]; (+) knowledge of symptom [83]; disease [80, 81] |
| Ability/experience in handling health related conditions and perceived needs for accessing health services | (+) Awareness of the need for healthcare services [38, 54, 56]; (-) home remedies [71] or management of childhood illness [53, 85] | (+) Perceived needs for healthcare services [21, 68, 75, 76, 91, 94, 113, 129]; (-) home delivery [82] |
| Perception/knowledge/experience/preference of health services | (-) Fear of mistreatment [72, 101] and (-) doubts about medical care [38, 79, 100]; gender-induced affordability [102]; (-) provider shopping [71] | (positive) Perception of healthcare services [21, 42, 64, 76, 84, 86-90] and providers [21, 85, 94, 112, 125]; (+) knowledge of health services [21, 42, 49, 61, 68, 75, 82, 86, 91-94] or facilities [21, 95, 96]; (+) previous use of related healthcare services [39, 42, 50, 60, 62, 67, 80, 97, 98]; (-) bad experiences of friends and relatives at healthcare facilities [95]; (-) misunderstanding or fear [21, 68, 75, 76, 89, 99, 129]; gender healthcare worker preference [88], (-) side effect [82]; lack of trust [46] |
| Socioeconomic factors | | |
| Socioeconomic status | (-) Social class [104]; social group (caste) of caregiver [54] | (+) Socioeconomic status [21, 39, 40, 47, 57, 62, 82, 103]; Caste [109, 115]; (rent-> negative) residential background [21, 47, 69, 82]; (+) possession of ration card [69] |
| Marital status | (married) Marital status [70] | (married) Marital status [18, 41]; duration of marriage [42] |
| Family composition & Living arrangement | (-) Family size [54] | (±) Family type [39, 51, 116, 127]; (±) family size [67, 69]; (-) number of children in household [21, 44, 49]; (+) number of male children [136]; (+) |

| | | |
|---|---|---|
| | | housing condition [21] |
| Education | (+) Education [54, 56, 58, 70] | (+) Education [39, 41, 42, 45, 49, 57, 59, 61, 62, 66-68, 81-83, 107-109, 115-117, 127, 135]; (±) husband education [44, 51]; (+) mother's education and literacy [21, 43, 47, 57, 60] |
| Income and wealth | (+) Income [56, 118]; (+) wealth [55, 58]; (-) inability to afford care [19, 38, 77, 79, 85, 90, 101, 110, 111] | (+) Income [41, 50, 51, 68, 81, 105]; (+) wealth [21, 49, 61, 66, 106-109]; (-) financial constraint [21, 46, 74, 87, 103, 112-114] |
| Occupation | (+) Occupation [54, 58, 70] | (+) Employment [21, 66, 84, 119, 127]; (±) occupation [49, 67, 81, 83, 105, 135]; (±) occupation of spouse [51, 61] or household [69] |
| Social support | (-) Difficulty in reaching services (security risk at night) [100]; (+) accompanying person [77]; decision making person for seeking health care [54] | (+) Family support [75, 88]; (+) social connectedness [94]; (+) socioeconomic support [122]; permission for immunisation by decision-maker [129] |
| Competing priorities/lack of time | (-) Competing priorities (ability to work and income) [120]; (-) not want to miss work [71]; (-) lack of time [101, 121] | (-) Competing priorities [74, 82, 94]; (-) risk of lost income [21]; (-) parents being too busy [21] |
| Physical environment | | |
| Distance from health facility | Proximity of healthcare facilities [38, 55, 77, 85, 123]; geographical distance of formal healthcare [102] | (-) Distance from health facility [21, 47, 81, 86, 96, 109, 124-127] |
| Transport | (+) Travel assistance [77]; (-) no transportation [38] | (-) Lack of transportation [83, 96, 103]; (-) variability in traffic congestion [128] |
| Environment of residence area | (-) Difficulty in reaching services (darkness at night) [100] | Residential background [21, 69, 106] |
| Cultural and religious factors | | |
| Religion | Religion [70] | Religion [41, 57, 60, 76, 115, 129] |
| Sociocultural influence | (-) Stigma [79, 102, 130]; mother tongue [70]; (-) difficulties in disclosing the symptoms, (-) neglecting behaviours, and socio-cultural influences [78]; (+) cultural competency of care [102]; (+) easy communication [102]; living with the burden of cultural expectations [102]; (-) no permission to seek care from family [38] | (-) Exposure to media [80, 98]; stigma [129]; (-) cultural expectation for women after birth and fear of stigma for pregnancy out of wedlock [94] |
| Tradition | **(-)** Traditional medicine [100] | **(-)** Traditional remedies [76]; **(-)** home remedies [87] |
| Legal, political and policy factors | | |
| Legal issues | **(-)** Perceived illegality of abortion [79] | Type of slums and possession of a ration card [80] |
| Health system factors | | |
| Accessibility | (+) Ease of access [102]; (-) late facility opening times [85] | (-) Limited access to the services due to location [91, 94]; (-) timing of services [21, 87]; household visit by health workers [21] |
| Quality and safety of services | Quality of treatment and expected outcome of therapies [38, 102]; (-) delay in advising related tests [71]; | Quality of service [67, 86, 87, 92, 113, 125]; (-) adverse events [76] |

| | | |
|---|---|---|
| | referral [71]; optimal examination [85, 110]; (-) provider shopping [71] | |
| Charges for health services | (+) Insurance coverage of both public and private providers and of extended family members [137] | (-) Average out-of-pocket healthcare expenditure [134]; healthcare insurance [18, 64, 83] |
| Service organisation and delivery arrangement | (-) Medical turnover and overload or healthcare providers [131]; (+) government/NGO facility [118]; (-) private hospital [38]; early engagement by healthcare workers [55] | Attitude of healthcare providers [87, 96]; mode of delivery [39, 57, 60, 63, 82, 138]; (-) hospitals refused to accept health insurance cards [95] |
| Facility & resources | Availability of medicines and supplies [85, 110]; (-) lack of healthcare facilities [139] | Type of healthcare facility [40, 86, 96, 117, 132, 134]; inadequate resources [91]; (+)number of available healthcare workers [47]; (-) unavailability of female birth attendants [113] |
| Waiting time | **(-)** Waiting time [73, 85, 110] | **(-)** Waiting time [86, 87, 112, 133] |

**(-)** negative association; **(±)** inconsistent/conflicting evidence or context-dependent; **(+)** positive association; NGO: non-governmental organisation

**Supply side: Provision of healthcare services**

Ten articles described factors associated with provision of healthcare services in slums from the service providers' perspective. None of the studies reported personal and biological factors. Factors related to other categories are summarised below.

Cognitive and experiential factors: Odhiambo et al. reported slum residents' fear of side effects, size of tablet and misconceptions regarding treatment as the factors hindering drug administration activities by healthcare workers for a deworming programme in Kenya [140]. On the other hand, this study also reported a high demand for drugs from slum residents in the final year of this program because people realised that free treatment was to be ended [140].

Socioeconomic factors: effective community mobilisation was a facilitator [140] whereas poor community support [141] and insufficient time allocated for providers to implement healthcare programmes [140] were barriers for provision of healthcare services in slums. In the deworming programme mentioned above, community health workers reported that direct observation of slum residents taking deworming drugs after meals was sometimes not feasible because slum residents skipped or age late at night due to food shortage [140]. Some slum residents demanded money to take the deworming drugs, either to facilitate purchase of food or to have their own share of the money that they perceived the community health workers would be paid by the programme if they complied with taking the drugs [140].

Physical environment: poor sanitation [140, 142], presence of rodents and no pavement [142], bushy and unprotected environment [140] were reported as factors making the provision of healthcare services difficult in slums.

Cultural and religious factors: religious beliefs and mistrust of interventions [140], lack of a shared understanding of the needs, purposes and consequences of family planning and pregnancy related services among slum residents and healthcare providers [74] were the

barriers for healthcare services provision. In the previous deworming programme, portrayal of unrelated death being linked to the programme and related negative publicity affected participants' compliance [140].

Legal and political factors and policy: devolution of service delivery through downward transfer of funds and responsibilities from central/national government level to elected local bodies; management by professional managerial and technical cadres; tight organisation of public health services; and professional support from the state directorate of public health were found to strengthen public health service provision in Chennai slums compared with Delhi [143]. One study reported that policies affected healthcare provision negatively because of staff shortage arising from change and suspension of the appointment of health promotors, which led to overwork and lack of time to provide required care by healthcare staff [133]. In Brazil, home visits for the provision of healthcare services was hampered because slum residents could not present documents required to register for healthcare [142]. On the other hand, giving priority to socially less developed areas for strengthening the Family Health System in Brazil might have been associated with better service coverage for slum residents with tuberculosis compared with their urban non-slum counterparts [144].

Health system: pay scale of frontline healthcare workers [141], knowledge of intervention area by community health workers [140], issues related to rigid task assignment by service managers [142], requirement to follow standardised protocol [142], demands from the management [142], work burden [133, 142] and no incentive [141], insufficient time [140], attitude [74] and support of healthcare providers [141], ill-defined geographic boundary of service with unserved areas and left-out urban slum pockets [145] were associated with healthcare service provision in slums.

Lack of community-based care (such as school-based education for reproductive health and community support networks for women) [133], unreliable immunisation and household data [129]; inefficient utilisation of funds [129], affordability (price) and availability of medicine [146], limited medical supplies [74, 141] and infrastructural facilities [141], inadequate space and equipment [142, 145], suboptimal training of staff [145], insufficient availability of logistics, and health manpower [145] also affected service provision. (Table 3)

Table 3. Factors associated with provision of healthcare services in slums from service provider's (supply side) perspective.

| | |
|---|---|
| Cognitive and experiential factors | |
| Perception/knowledge/experience/preference of health services | Fear of side effects, size of tablet and misconceptions regarding treatment, high demand for drugs in the final year of treatment [140] |
| Socioeconomic factors | |
| Income and wealth | Difficulty in directly observing deworming treatment at meal time due to food shortage [140] |
| Social support | Effective community mobilisation [140]; poor community support [141]; ; non-involvement of community members and Urban Local Bodies [145]; absence of community members during the drug administration exercise [140]; demand for incentives by community members to take deworming drugs [140] |
| Physical environment | |
| Environment of residence area | Environment (sanitation, territory) [142]; unsanitary environmental conditions [140]; inaccessibility (filthy and bush environment) [140] |
| Cultural and religious factors | |
| Religion | Religious beliefs and mistrust of interventions [140] |
| Sociocultural influence | Lack of shared understanding of the problems in community [74]; unrelated death and the associated negative publicity (of a deworming programme) by the media [140] |
| Legal, political and policy factors | |
| Policy issues | Devolution of service delivery transferring funds and responsibilities to elected local bodies [143]; management by professional managerial and technical cadres [143]; tight organisation of public health services [143]; professional support from the state directorate of public health [143]; healthcare policies [133]; policy prioritizing low social development areas [144] |
| Legal issues | Fear of requirement for formal registration [142] |
| Health system factors | |
| Cost | Pay scale of frontline healthcare workers [141]; medicine price [146] |
| Quality and safety of services | Knowledge of intervention area by community health workers [140] |
| Service organisation and delivery arrangement | Issues related to assignment of tasks [142]; requirement to follow standardised protocol [142]; demands from the management [142]; work overload [133, 142]; underperformance of staff [129]; documentation work/work burden/no incentive for work [141]; insufficient time [140]; attitude of healthcare providers [74]; lack of supportive staff [141]; community health worker familiarity with households led to warm reception [140]; opportunity to integrate mass drug administration with other health interventions [140]; presence of community health workers and their supervisory structure, and points of referral for serious side effects [140]; restriction of range of services [145]; unserved areas and left-out urban slum pockets [145]; poor monitoring and supervision [145]; unreliable immunisation and household data [129] |
| Facility & resources | Community-based care [133]; inefficient utilisation of funds [129]; affordability and availability of medicine [146]; limited medical supplies [74, 141]; infrastructural facilities [141]; inadequate space and equipment [142]; suboptimal training of staff [145]; insufficient availability of space, logistics, and health manpower [145] |

**Comparison between slums and other settings**

Seven studies which met our inclusion criteria also included data from non-slum urban and/or rural areas and potentially allowed exploration of factors associated with healthcare access across different settings. Key findings from these studies are summarised in Table 4.

These recent studies showed a mixed and dynamic picture of healthcare access across slum and other settings and reported various factors associated with this. For example, the proportion of young children fully immunised was found to be lower in slums compared with non-slum urban setting but was higher than rural settings in Nigeria. Nevertheless the coverage improved over time across all settings [60]. While many common factors associated with full immunisation of young children were identified, giving birth in health facilities (as opposed to home) had a larger positive effect on subsequent immunisation coverage in slums compared with non-slum urban and rural settings [60]. A narrowing of gaps in delivery by skilled birth attendants between slum and non-slum urban settings over time and a reverse of the trend from having lower usage to higher usage of modern contraceptive methods by married women in slums versus urban non-slums were reported in Bangladesh [47]. Slum residents reported financial issues being the main reason for not taking prescribed drugs whereas getting better was the cited main reason for urban non-slum residents in Iran [114]. Better coverage of services and higher rates of treatment completion were reported for patients with tuberculosis in slums compared with non-slum urban setting in two studies in Brazil [52, 144], where a higher priority given to enhancing the Family Health system in socially less developed areas in recent years was suggested to be a likely factor associated with better service provision in slums [144]. (Table 4)

Table 4. Studies that examined factors associated with health care seeking and utilisation in both urban slum and non-slum urban and rural settings

| Study & location | Differences in healthcare access | Associated factors |
|---|---|---|
| Kanyango (2021) [137] | *Preferences and willingness to pay for health insurance*<br>Households in non-slum communities had a high preference for health insurance plans covering chronic illnesses and major surgeries to other plans. | Coverage of extended family (vs restricted enrollment of children); coverage of both private and public providers (vs private only) |
| Obanewa (2020) [60] | *Fully-immunised child coverage (FIC)*<br>Proportion in slum lower than urban non-slum but higher than rural; proportions increased between 2003 and 2013 across all three settings | From multivariable regression*: year, birth order, antenatal attendance, maternal education level, religion, maternal age at child's birth, media exposure, region of the country, interaction between place of residence and place of delivery |
| Angeles (2019) [47] | *Use of modern contraceptive methods*<br>Proportion changed from being lower in slums in 2006 to being higher in slums in 2013 compared with urban non-slums | From multivariable regression*: parity, mother's age, mother's education attainment, socioeconomic status, interaction (slum × time period) |
| | *Delivery by skilled birth attendant*<br>Proportion substantially lower in slums compared with urban non-slums but the gaps narrowed over time) | From multivariable regression*: Residing in slums, parity, mother's age, mother's education attainment, length of stay in current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Islam (2018) [107] | ***Antenatal care visits***<br>"there was a large inequality" between slum and urban non-slum (detail not reported) | Level of educational attainment, wealth index of the household |
| | ***Using contraceptive methods***<br>"Prevalence rate higher among slum women" than urban non-slum women | Not reported |

| | | |
|---|---|---|
| Tabrizi (2018) [114] | ***Utilisation of health services in the past 30 days***<br>Similar utilisation overall, but with lower proportion received needed health services and used private clinics, higher use of vaccination and maternal health services, and lower use of services for heart failure and hypertension for slum residents compared with urban non-slum | High cost of services |
| | ***Home care services***<br>Very little use both in slum and urban non-slum areas | High cost of services |
| | ***Prescribed drug during last visit to health facilities***<br>Lower proportion for slum vs urban non-slum | Not reported |
| | ***Not taking drugs prescribed***<br>Higher proportion for slum vs urban non-slum | Main reason: financial problems for slum vs getting better/feeling well for non-slum urban |
| Snyder (2016) [52] | ***Directly observed treatment coverage for tuberculosis (TB)***<br>Higher for slum vs urban non-slum TB patients | Not examined |
| | ***Abandonment of TB treatment***<br>Lower for slum vs urban non-slum TB patients | From multivariable regression*: residency in a slum, sex, age, extrapulmonary clinical disease, HIV/AIDS, interaction (directly observed treatment x residency in a slum) |
| Prado Junior (2016) [144] | ***Coverage under Family Health system for TB patients***<br>Higher for slum vs urban non-slum | Giving the Family Health strategy priority to coverage of areas with lower social development |

*From the model with most comprehensive adjustment including residency in slum as one of the variables; only factors that were statistically significant (at 5% level) are shown. AIDS: Acquired Immune Deficiency Syndrome; HIV: human immunodeficiency virus; TB: tuberculosis.

# DISCUSSION

## Statement of principle findings

This scoping review of recent literature examined demand side factors associated with slum residents' healthcare accessing and utilisation, as well as supply side factors associated with provision of health services in slums. We found over 104 studies related to the former, but only 10 studies related to the latter. We identified different factors associated with accessing, utilisation and provision of health services in slums, and mapped them to a conceptual framework developed and refined for this review into seven broad categories (Figure 2).

## Findings in the context of existing literature

Even though previous reviews have investigated factors associated with healthcare access in various settings [147, 148], to our best knowledge this scoping review is the first that has examined wide-ranging factors across different service areas of health care in slums. Our findings are consistent with previous studies which highlighted common factors associated with healthcare seeking and utilisation such as age, income and education [147, 149]. We identified several factors that are particularly pertinent in slum settings, such as costs of healthcare [19, 21, 74, 77, 79, 85, 90, 101, 103, 110-112], lack of time due to slum residents' competing priorities [21, 101, 121] and issues arising from adverse physical environment [83, 103, 140, 142], security [100, 142], fear of formal registration due to distrust of the authorities [142] and proximity of healthcare facilities [21, 77, 81, 85, 86, 109, 123-126]. In addition, included studies showed that the effects of a given factor may differ between slum, urban non-slum and rural settings [60].

Healthcare cost is a major barrier between the intention to seek care and actual utilisation of services [110, 139]. Healthcare provision supported by tax-based financing and/or various

forms of social and private insurance that reduce out-of-pocket expenditure at point of care could be potential measures to overcome this barrier and help achieve universal coverage goals. Limited evidence showed that initiatives prioritising primary healthcare coverage in slums could improve access [144], but there is insufficient evidence from studies included in this review to determine the best model of healthcare financing for improving healthcare access and coverage in slum settings.

Although possession of/coverage by health insurance was associated with higher levels of utilisation of health services among slum residents [18, 83], studies showed that uptake of government-run public insurance among slum residents was low [69, 84]. This may be attributed to lack of awareness, difficulties in navigating through the health system and in obtaining official proof of identity required for enrolment [69], and poor quality of care and range of services offered [69, 84]. Even among slum residents covered by health insurance, access to care was often refused and additional charges were frequently requested [95]. Policies that aim to improve access to healthcare services among slum residents through public health insurance will need to address these challenges.

Several studies reported lack of time and competing priorities as a factor affecting healthcare-seeking behaviour [101, 120, 121] and health services utilisation [21, 74, 94]. This suggests a delicate balance between factors that individual slum residents have to strike when making decisions on healthcare seeking and utilisation. Var der Heijden et al. showed that health was considered as an asset for working ability in slums [120], but paradoxically the ability to work often seems to impede healthcare seeking for health issues. This highlights the importance of considering slum residents' interest and priorities when providing healthcare services and promoting healthcare utilisation in slums.

**Strengths and weaknesses of the review**

This scoping review has several strengths. We conducted a comprehensive literature search using generic terms related to slums with few other restrictions. The search was therefore likely to be sensitive for identifying relevant literature. Contemporary methodological guidelines for undertaking scoping reviews were followed [22], and a conceptual framework which was adapted based on emerging findings was used to facilitate the organisation of evidence.

The review has enabled theory building and refinement of a conceptual framework. Our preliminary framework included six categories (Figure 1). During data coding and extraction, it emerged that many studies reported perception, knowledge, and experience of slum residents being associated with their healthcare-seeking and utilisation. We subsequently classified these factors as cognitive and experiential factors, which primarily consists of three subcategories: knowledge/experience of illness, perceived needs for accessing healthcare services, and perception/experience of healthcare services. These factors were influenced by other factors included in our original conceptual framework, but highlighted the crucial links between those factors and the ultimate actions by individual slum residents to access health services. Future interventions to promote health service utilisation for slum residents [150] could make use of our framework to develop programme theories and map out causal pathways.

This review also has some limitations. Given time constraint, we were only able to examine the most recent literature published in English in academic journals, and have not examined the methodological quality of individual studies (which we noted to be quite varied) in detail. We attempted some preliminary synthesis to configure the identified evidence but have not explored the complex relationship between the factors identified and their interplay with the context of individual slums in depth. Nevertheless, findings from this scoping review will provide a good foundation for further syntheses.

**Methodological considerations**

A number of challenges in the process of classifying and coding data are worth mentioning. Firstly, access to healthcare has been conceptualised and defined in various ways in previous studies. The World Health Organization suggested six building blocks of a health system including service delivery, health workforce, health information systems, access to essential medicines, financing, leadership/governance to strengthen health systems [151], and in the report, defined access to healthcare as public responsibility for ensuring all citizens' entitlements to the protection of their health beyond simply proportion of a target population that benefits from an intervention or universal coverage [151]. They also pointed out system constraints such as financial access difficulty, physical access difficulty, low knowledge and skills, poorly motivated staff, weak leadership and management, ineffective intersectoral action and partnership as barriers to access [151]. The WHO's definition and conceptual framework focus on health system level factors and would be particularly useful when examining supply side factors, which seem to be under-studied based on our findings. As described in the Methods section, we primarily adopted the conceptual model of healthcare access developed by Levesque and colleagues given our shared focus on service users. However, in our conceptual model we separated the dynamic stages of 'accessing' healthcare from the actual 'accessed' healthcare utilisation to highlight the crucial match required between the demand side and supply side factors to facilitate access to healthcare.

Several factors associated with healthcare accessing and utilisation can be viewed from different perspectives and therefore potentially be coded under different categories. For example, barriers for healthcare seeking and utilisation related to costs can be considered as socioeconomic issues from the slum dwellers' perspective but can also be viewed as health

system issues for not offering the services in an affordable way. Indeed, previous access frameworks suggested that access is created and negotiated in a dynamic interchange between households/communities and healthcare workers/systems (i.e. demand and supply) on each access dimension [34, 152]. In such situations, we tried to code a factor under the category that most directly reflects the original data through discussions within the review team (in the example of healthcare cost, the factor was coded primarily under socioeconomic factors rather than health system factors when the factor was reported by slum residents as a barrier); otherwise more than one category was coded (for example, bad experience from previous utilisation of health services was coded both as a cognitive and experiential factor and a health system factor).

**Implication for research and practice**

The multitude of factors identified in this review are often inter-related and inter-acting, and span across personal, family, community and society levels. For example, the association between occupation and healthcare utilisation were reported in several studies [49, 61, 67, 81, 83, 105]. The effect of predominantly casual work undertaken by slum residents on their healthcare access could be mediated through working hours, income level, knowledge of health and available services, etc. There is also possibility that occupation was associated with health status and hence needs for healthcare services, instead of/in addition to behaviour of using healthcare services. Teasing out the complicated relationships between various determinants and their interaction with the diverse contexts of slums will require in-depth analysis and a more holistic approach to synthesising the evidence. Given the unique features of individual slums, service planners and policy makers will need to examine these relationships with due consideration to the context specific to each locality and geospatial features and neighbourhood

effects that characterise slum settings [4].

We found far fewer studies that have examined health service providers' perspective than studies that have investigated factors associated with accessing healthcare from slum residents' perspective. There may be scope for greater research and policy attention to supply-side factors, including experiences and practices of local frontline healthcare providers, availability of healthcare facilities and infrastructure and policy to support them in order to overcome the many barriers highlighted from both supply and demand sides.

Although only six of the included studies explored factors associated with healthcare access or health service provision across slum and non-slum settings, they showed a generally encouraging picture that access to and provision of healthcare are continuously evolving (and often improving) in slums and other settings, and equality between different settings is not beyond reach.

## CONCLUSION

This scoping review summarises a large body of recent literature evaluating factors associated with seeking and utilisation of healthcare by slum residents, but found substantially fewer studies examining factors associated with provision of health services from providers' perspective. Recent migration into slums; knowledge, perception (including misconception and distrust) and past experience of illness, healthcare needs and health services; financial constraint, competing priorities and inadequacy of social support; adverse physical environment and unfavourable locality; sociocultural expectations and stigma; lack of official recognition; and various problems in existing health system all contribute towards the challenges faced by slum residents. Future research and policy aiming at improving healthcare

services in slums should pay more attention to supply side issues ranging from individual healthcare providers and practices to structural and policy level factors to tackle different barriers faced by slum residents, which in turn need to be evaluated holistically and take into account local context and geospatial features of slums.

**List of abbreviations**

GRADE: Grading of Recommendations Assessment, Development and Evaluation

LMICs: Low and Middle income Countries

MMAT: Mixed Methods Appraisal Tool

WHO: World Health Organization

**Ethics approval**

Not applicable. This realist synthesis included literature that is available in the public domain and did not involve the collection of personal data.

**Consent for publication**

The authors were required to notify the funder of the research, the UK National Institute for Health Research (NIHR) prior to the publication of this manuscript. The funder did not otherwise play any roles in the preparation of the manuscript and decision to submit it.

**Availability of data and materials**

All data relevant to the study were included in the article or uploaded as supplementary information. No additional data were available.

**Competing interests**

The authors declare that they have no competing interest.

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**Contributor**

JEP, BH, MA, FG and YFC conceptualised the scoping review; JEP carried out literature searches; JEP, PK, GY, OO, and YFC participated in study screening and coding; JEP and YFC performed data charting and drafted in initial manuscript. NA, PG and RL provided critical input during the drafting of the manuscript. All authors commented on and contributed to the revision of subsequent versions and approved the final version for submission.

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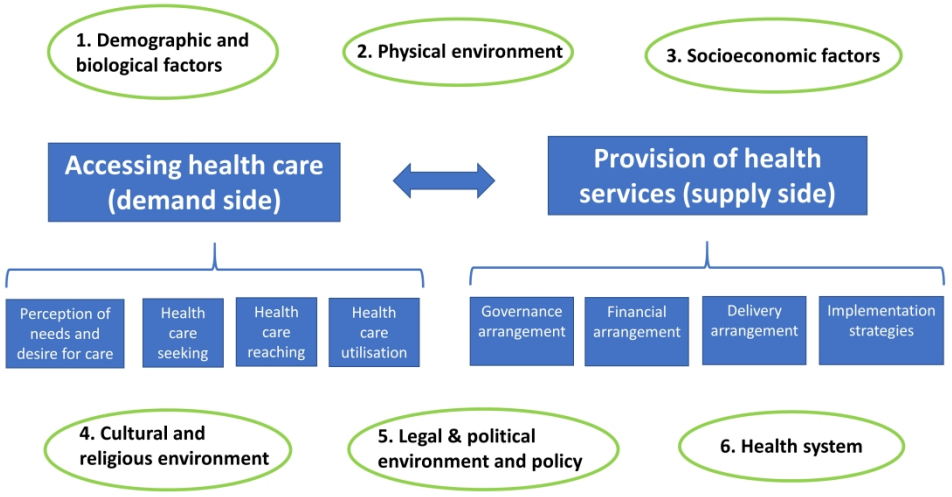
Figure legends.

Figure 1. Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

Figure 2. Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

Figure 3. Flowchart.




Preliminary framework for factors influencing slum residents' healthcare seeking behaviour and utilization of health services and the provision of services in slum settings

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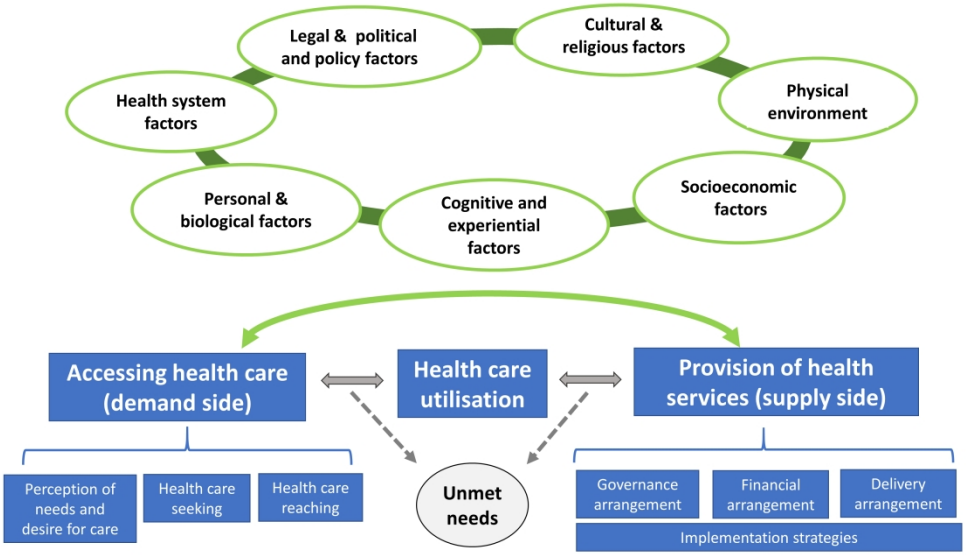


Updated framework of factors influencing healthcare-seeking behaviour/healthcare utilisation/provision of healthcare services in slums.

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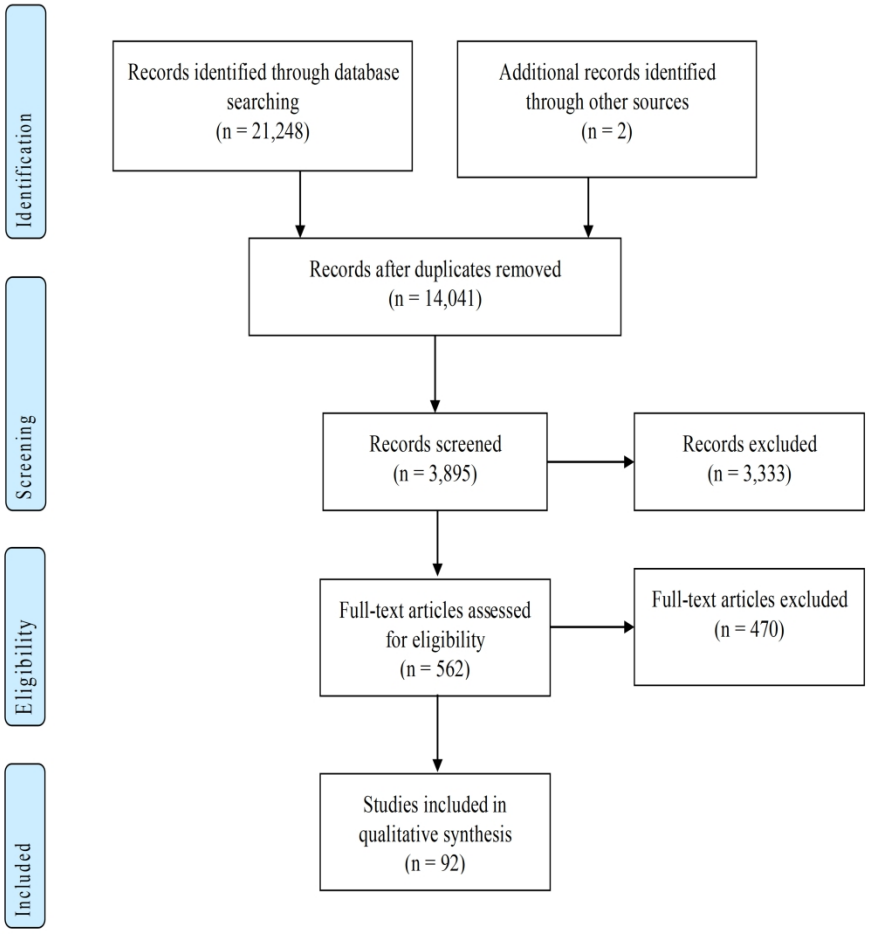


Flowchart

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Supplement 1. Healthcare-seeking behaviours of slum residents reported by included studies and associated factors.

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General healthcare seeking behaviour | Pakhare (2021)[55] | Slum residents diagnosed hypertension or diabetes | India | Prospective study | Quantitative | Linking to healthcare facilities | Age; wealth; distance to facilities ; early engagement by healthcare workers |
| | Gaiha (2020)[121] | Hetero-couples in slums | India | Cross-sectional study | Mixed method | Ability to attend a health promotion activity | Lack of time related to work as a reason for low male participation |
| | van der Heijden (2019)[120] | Female workers and key informants in slums | Bangladeshi | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Competing interest (ability to work and income) |
| | Aleemi (2018)[118] | Slum residents | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Household income; government facility; NGO facility |
| | Wekesah (2019)[139] | Slum residents | Kenya | Cross-sectional study | Qualitative | Care-seeking and adherence to treatment for CVD | Cost of healthcare; lack of healthcare facilities |
| | Kar (2017)[58] | Slum residents | India | Cross-sectional study | Quantitative | Undiagnosed hypertension | Sex; poverty; unskilled laborer; literacy |
| | Mistry (2016)[71] | TB patients in slums | India | Retrospective study | Quantitative | Delays in care seeking | Perception of symptoms; home remedies; not want to miss work; provider shopping; delay in advising TB-relevant tests; referral. |
| | Kulkarni (2016)[70] | Women in slums | India | Cross-sectional study | Quantitative | Participation in breast cancer screening | Age; education; religion; Mother tongue; occupation; marital status; tobacco habits; family history of cancer; history of cancer screening |
| | Misra (2017)[101] | Slum households | India | Cross-sectional study | Quantitative | Health-seeking practice for cataract | Lack of time, fear of surgery, financial difficulties |

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| | Ramagiri (2020)[77] | Slum residents with diabetes | India | Case control study | Mixed-method | Uptake of diabetic retinopathy screening | Realization of consequences of disease; travel assistance and proximity of the screening facility; absence of an accompanying person; cost |
| Healthcare for children | Mohanty (2021)[54] | Caregivers of under-five children in urban slums, | India | Cross-sectional study | Quantitative | Healthcare seeking for children | Sex of child; size of the household; social group of caregiver, mother with mass media knowledge; age of mother; education and occupation of mother; suffering from chronic disease; decision making person for seeking health care; time lapse in approaching the health care facility; income loss due to children illnesses |
| | Lungu (2020)[53] | Caregivers of children under 5 years of age in slums | Malawi | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Age; illness was perceived to be severe; fever; home management of childhood illness |
| | | | | | | Timely healthcare seeking behaviour | Home management of childhood; knowledge of caregivers about child danger signs |
| | McNairy (2019)[19] | Slum households with children ≤ 5 years old | Haiti | Cross-sectional study | Quantitative | Healthcare access | Inability to afford care |
| | Hutain (2019)[100] | Caregiver at the time of the child's death in slums | Sierra Leone | Cross-sectional study | Mixed-method | Health care-seeking | Use of traditional medicine; difficultly reaching the health facility; doubts about need for medical care; mistreatment by staff |
| | Kerai (2019)[56] | Caregiver of children aged 2 months to 5 years in slums | Pakistan | Cross-sectional study | Quantitative | Healthcare-seeking behaviour | Age of child; gender of child; income; education of caretaker; vaccine awareness; breastfeeding awareness; |

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| | | | | | | | presence of symptoms such as fever, tachypnea, chest indrawing, persistent vomiting, recurrent illness. |
| | Lungu (2018)[110] | Caregivers of children under 5 years of age in slums | Malawi | Prospective study | Quantitative | Healthcare-seeking behaviour | Cost; waiting time; availability of medicines and supplies; attitude of health workers; thorough examination of the child |
| | | | | | | Willingness to pay for the health facility | Waiting time; availability of medicine and equipment; superficial or thorough examination; attitude of health workers |
| | Kamati (2019)[73] | Slum residents | Namibia | Cross-sectional study | Mixed-method | Self-medication | Perceived diagnosis as "minor or mild"; waiting times and queues to receive care |
| | Mishra (2017)[65] | Mothers living in slums with a child and migrated recently | India | Cross-sectional study | Quantitative | Healthcare seeking behaviour | Symptoms and severity |
| | Lungu (2016)[85] | Caregivers and health providers in slums | Malawi | Longitudinal study | Qualitative | Healthcare-seeking behaviour | Home management; lack of medicines and supplies; waiting times; facility opening times; attitude of health workers; suboptimal examination of the sick child; distance to health facility; cost of healthcare |
| Healthcare for women | Muralidharan (2019)[123] | Girls and mothers in slums | India | Cross-sectional study | Qualitative | Healthcare-seeking behaviour | Proximity of healthcare facilities |
| | Nasrin (2019)[111] | Married women with a child in slums | Bangladesh | Cross-sectional study | Mixed-method | Healthcare-seeking behaviours | Inability to spend the treatment cost |

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| | Jayaweera (2018)[79] | Girls and women in slums | Kenya | Cross-sectional study | Qualitative | Access to contraception and abortion in health facilities | Stigma; lack of education about safe methods of abortion; perceived illegality of abortion; limited access to services because of financial barrier; fear of mistreatment and mistrust of health providers/facilities; geographical proximity |
| | Williams (2018)[130] | Mothers and medical personnel in slums | Bangladesh | Cross-sectional study | Qualitative | Mental healthcare seeking | Culture and stigma |
| | Ilankoo (2018)[78] | Women in slums | Sri Lanka | Cross-sectional study | Qualitative | Health-seeking behaviours related to vaginal discharge | Confusion in differentiating normal from abnormal vaginal discharge; effects on day-to-day life; confusion toward the causative factors; difficulties in disclosing; neglecting behaviours; and socio-cultural influences toward health-seeking behaviours. |
| | Athie (2017)[131] | Anxious and depressed women in slums | Brazil | Cross-sectional study | Qualitative | Healthcare seeking behaviour | High medical turnover and overload of healthcare providers |
| | Sudhinaraset (2016)[90] | Mothers and their families in slums | India | Cross-sectional study | Qualitative | Maternal health services and delivery experiences | Financial barriers; disrespectful care |
| | Pune Municipal corporation[38] | Recently delivered slum residents | India | Cross-sectional study | Mixed-method | Seeking front-line worker during labor | No time to call; family did not allow; being out of town; lack of trust; delivery at night |
| | | | | | | Going to the Referral Place for Pregnancy Complications | Not necessary; family did not allow; lack of trust/poor quality services; don't like going to a difference facility; too far; cost; no transportation; private hospital |
| Preference for | Das (2018)[102] | Slum | India | Cross- | Qualitative | Healthcare-seeking | Female prefer informal healers |

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| healthcare providers | | residents | | sectional study | | practice (preference for formal/informal healers) | (cultural competency of care, easy communication, gender-induced affordability, avoidance of social stigma and labelling, living with the burden of cultural expectations and geographical and cognitive distance of formal health care) |
| | | | | | | | Male prefer formal care (ease of access, quality of treatment, expected outcome of therapies) |
| | Angeli (2018)[104] | Slum residents | India | Cross-sectional study | Mixed-method | Choice between public or private hospitals | Bottom-of-the pyramid patients visit a public hospital more than top-of-the-pyramid patients |
| Health insurance | Kalyango* (2021)[137] | Households in slum and non-slums | Uganda | Cross-sectional study | Qualitative | Willingness to pay for health insurance | Public and private providers; extended family enrolment |
| HIV testing | Thomson (2018)[72] | Stakeholder including residents and healthcare service provider | Kenya | Cross-sectional study | Qualitative | HIV testing | Denial; complacency; fear of death; anticipation of unbearable stress; felt ill; had a partner die; learned that their partner was HIV-positive. |
| Expenditure | Mishra (2017)[59] | Slum households with a child aged 0–14 years and who had migrated within the last 12 years | India | Cross-sectional study | Quantitative | Treatment-seeking behaviour | Child's gender |

*Factors reported in the study were associated with participants covering both slum and non-slum residents. CVD: cardiovascular disease; HIV: human immunodeficiency virus; NGO: non-governmental organization; TB: tuberculosis.

Supplement 2. Healthcare utilisation of slum residents reported by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General utilisation | Wambiya (2021)[64] | Slum household members | Kenya | Cross-sectional study | Quantitative | Private and public healthcare utilisation | Public- satisfaction with cost; satisfaction with healthcare quality; having acute infection or other diseases<br><br>Private- insurance coverage; having acute infection |
| | Chauhan (2020)[96] | Elderly slum residents | India | Cross-sectional study | Quantitative | Utilization of healthcare services | Unawareness of healthcare facilities; behaviour of service providers; distance from home; transport facility; amenities at healthcare facilities; convenience for attendants |
| | Otieno (2020)[134] | Slum household members | Kenya | Cross-sectional study | Quantitative | Access to primary healthcare services | Sex of household head; average out-of-pocket healthcare expenditure; source of primary care |
| | Vora (2020)[46] | Slum household members | India | Cross-sectional study | Quantitative | Unmet need for surgical services | Financial reasons; lack of trust; age; sex; type of problem |
| | Agrawal (2019)[115] | Older adults in slums | India | Cross-sectional study | Quantitative | Utilisation of welfare schemes | Religion; Caste; education; |
| | Ahmed (2019)[128] | N/A | Bangladesh | Cross-sectional study | Quantitative | Access to, and availability of, healthcare services | Variability in traffic congestion |
| | Madan (2019)[87] | Female slum residents | India | Cross-sectional study | Qualitative | Access to primary care | Long waiting times and opening times of the primary health care; quality of services; satisfaction with treatments; home remedies; cost; rude attitude of healthcare providers |
| | Owiti (2018)[86] | Pregnant women in slums | Kenya | Cross-sectional study | Quantitative | Utilisation of maternal health services in public | Perception about public health facility delivery; living within close proximity; waiting time at |

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| | | | | | health facilities | the facility; learning about the program; quality of service; ANC attendance at a private and a non-profit health facility |
| Castiglione (2018)[112] | Slum residents | Brazil | Cross-sectional study | Qualitative | Barrier to healthcare services | *Public healthcare services:* structural aspects of the healthcare system in their community as a whole, such as scarcity of personnel and equipment, or long waiting periods; experiences of conflict when dealing with doctors and other professionals of the public healthcare system<br><br>*Private healthcare services*: Insufficient funds to seek assistance; services or products in the private sector; |
| Tabrizi* (2018)[114] | Households in slum and non-slums | Iran | Cross-sectional study | Quantitative | Utilisation of health services | High cost of services |
| | | | | | Home care services | High cost of services |
| | | | | | Not taking drugs prescribed | Slums:<br>financial problems<br><br>Non-slums:<br>getting better/feeling well |
| Wairiuko (2017)[88] | Elderly in slums | Kenya | Cross-sectional study | Mixed-method | Health service utilisation | Family support; satisfaction with healthcare services; gender healthcare worker preference; services by community health worker |
| Owusu-Ansah (2016)[83] | Slum residents | Ghana | Cross-sectional study | Qualitative | Utilization of healthcare | Education; occupation; NHIS membership; knowledge of symptom; overall knowledge score; transportation |

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| Adane (2017)[81] | Mothers/caregivers of under-five children in slums | Ethiopia | Cross-sectional study | Quantitative | Utilization of healthcare facilities in children with diarrhoea | Mothers/caregivers education; occupation; time of walking to the nearest health facility; household monthly income; recognized danger signs |
| MacPherson (2019)[124] | Slum residents | Malawi | Prospective study | Quantitative | Access to TB diagnosis | Distance to the nearest TB registration clinic |
| Wingfield (2017)[122] | Slum households with patients treated for TB | Peru | Randomized controlled study | Quantitative | Initiation of TB preventive th | Socioeconomic support and social support |
| Iberico (2016)[99] | Healthcare workers and community members in slums | Peru | Cross-sectional study | Qualitative | Utilization of TB preventive th | Misunderstanding and fear of treatment |
| Snyder* (2016) [52] | TB patients living in slum and non-slum | Brazil | Retrospective study | Quantitative | Abandonment TB treatment | Residency in a slum; sex; age; extrapulmonary clinical disease; HIV/AIDS; interaction (directly observed treatment × residency in a slum) |
| Oluoch (2017)[97] | Slum residents | Nairobi | Cross-sectional study | Quantitative | Attendance to HIV testing and counselling services | Previous test experience |
| Martinez Perez (2016)[89] | Healthcare workers and community members in slums | South Africa | Cross-sectional study | Mixed method | HIV Counselling and Testing | Fear; lack of trust |
| Amiresmaili (2019)[18] | Slum residents | India | Cross-sectional study | Quantitative | Utilisation of outpatients services | Gender; marital status |
| | | | | | Utilisation of inpatients services | Age of household head; marital status; insurance |
| Horng (2019)[49] | Slum households with children under 5 years old who either recently | Bangladesh | Cross-sectional study | Quantitative | Healthcare utilisation in severe acute respiratory illness | Relocation; age of child; education of mother; household wealth; health service knowledge |

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| | | relocated <12 months or who were residentially stable living >24 months | | | | Full vaccination coverage | Relocation; number of children in household; age of child; education of mother; occupation of household head; household wealth; health service knowledge |
| | Kuria (2018)[132] | Patients received hypertension treatment in slums | Kenya | Retrospective study | Quantitative | Compliance in hypertensive treatment | Health facility group than walkway or weekend clinic attenders |
| | Cernauskas (2018)[125] | Slum residents | India | Cross-sectional study | Quantitative | Health provider choice | Distance to health facilities; friendly attitude of healthcare workers; appropriate service; familiarity |
| | Kaba (2020)[74] | Stakeholders (community members, community opinion leaders, health professionals, health office representatives.) | Ethiopia | Cross-sectional study | Qualitative | Utilisation of health services | Individual level: awareness about health problems; competing priorities; capacity to pay for services when referred. |
| | Mataboge (2016)[133] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Healthcare utilisation | Long waiting time |
| Immunisation | Muhammad (2021)[129] | Caregivers of children, community influencers, immunisation staff in peri-urban slums | Pakistan | Cross-sectional study | Mixed-method | Childhood vaccination | Permission for immunisation by decision-maker; lack of knowledge and awareness of the benefit of immunisation; misconceptions and fears regarding vaccines; social and religious barriers |
| | de Araujo Veras (2020)[45] | Children in slums | Brazil | Cross-sectional study | Quantitative | Childhood vaccination | Age of child: mother's education |

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| Mutua (2020)[106] | Children in slums | Nairobi | Prospective study | Quantitative | Full and on-time vaccination coverage | Place of residence; wealth |
| Roja (2020)[44] | Mothers of children in slums | India | Cross-sectional study | Quantitative | Immunisation status of children | Number of children in family; age of child; father's education |
| Obanewa (2020)[60] | Rural/urban formal/slum residents | Nigeria | Retrospective cross-sectional study | Quantitative | Fully-immunized child coverage | For slums: delivery place; maternal education; birth order; antenatal attendance; religion<br><br>For slum and non-slums: year; birth order; antenatal attendance; maternal education; religion; maternal age at child's birth; media exposure; region of the country; interaction between place of residence and place of delivery |
| Viramgami (2019)[119] | Married slum residents in reproductive age | India | Cross-sectional study | Quantitative | Vaccination status of child | Mother's employment |
| Singh (2018)[68] | N/A | India | Literature review | - | Childhood vaccination | Fear of adverse events; lack of information/knowledge; disease not harmful/serious; parents busy; income; mother's education; travel/transfer/migration; unawareness of need for health services; faith in immunisation; mother ill; forgetfulness; lack of initiative; family problems; services not available/lack of facility; shortages/reluctant to open 10 dose vials for 1 or 2 infants; current/history of sickness lead to withhold the vaccine |

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| Pugliese-Garcia (2018)[76] | Stakeholders including slum residents, healthcare workers, health committee members, vaccinators | Zambia | Cross-sectional study | Qualitative | Vaccine hesitancy | Traditional remedies; alcohol use; religious beliefs; distrust towards western medicine; previous adverse events; fear of injections and low perceived need for immunisation; limited understanding of how vaccines work; overlapping local terms for vaccine; pain; perceived risk of infection |
| Manandhar (2018)[93] | Slum household with children age of 12-60 months | Nepal | Cross-sectional study | Quantitative | Incomplete immunisation | Knowledge on immunisation schedule |
| Dasgupta (2018)[116] | Slum household with children aged 0-59 months, resides in the study area for the past 12 months | India | Cross-sectional study | Quantitative | Vaccine hesitancy | Family type; education of mother |
| Lae (2018)[50] | Caregivers in slums | Myanmar | Cross-sectional study | Qualitative | Utilisation of immunisation services | Age of child; income; migration; antenatal visit; receiving additional vaccines before; having immunisation card. |
| Schultz (2017)[126] | Parents with children <5 years old in slums | Kenya | Prospective study | Quantitative | Timeliness of vaccination | Close to the clinic; birth in December |
| Crocker-Buque (2017)[21] | People living in a low-income urban area or slum in a low-middle income countries | Multiple nations | Systematic review | - | Immunisation coverage | *Socioeconomic and demographic characteristics:* socioeconomic status; wealth; parents' literacy; mother's education; employment; residential status; place of residence; place of delivery; household visit by health workers; premature birth; malnourishment; inadequate housing; poor |

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| | | | | | | prenatal care; ethnicity; age; maternal age; birth order; sex of child; number of children<br><br>*Migration status:*<br>migration; recent migration<br><br>*Information, beliefs and behaviour:*<br>unaware of the need for vaccines; unaware of clinic location or timing; maternal knowledge of immunisation; lack of access to information; parents being too busy; return to home village; difficulty in accessing services; fear of side effects; attitude of health workers; concerns over cost; being suspicious of free services<br><br>*Health services:*<br>distance from health centre; timing of services; fear of costs; risk of lost income; lack of local knowledge; patients' satisfaction; provision of accurate information; accessing pre-natal care |
| Shrestha (2016)[82] | Slum households with children aged 12–23 months. | Nepal | Case-control study | Quantitative | Incompletion of immunisations. | Home delivery; type of residence; knowledge about healthcare services of primary care-taker; perception towards healthcare services, conflicting priorities, side effect |
| Devasenapathy (2016)[57] | Slum household with children aged between 12 and 42 months | India | Cross-sectional study | Quantitative | Childhood complete immunisation | Sex; mother's literacy; place of birth; place of childbirth; religion; socioeconomic position; birth certificate |

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| Maternal | Sendo (2021)[92] | Female slum residents | Ethiopia | Cross-sectional study | Qualitative | Delivery in healthcare facilities | Provision of quality, respectful and dignified midwifery care; lack of awareness about facility delivery. |
| | Kardalkar (2020)[135] | Female delivered within three months in slums | India | Cross-sectional study | Quantitative | Utilization of antenatal care | Literacy; Gravida; occupation |
| | Sendo (2020)[91] | Women of reproductive age in slums | Ethiopia | Cross-sectional study | Qualitative | Delivery in health facilities | Perceived benefits of home delivery; knowledge deficit about health facility-based delivery; poor access to healthcare facilities; inadequate resources |
| | Sharma (2020)[127] | Women delivered a baby within one year in slums | India | Cross-sectional study | Quantitative | Utilization of maternal healthcare services | Education; employment of mother; category and type of family; distance and time to reach health facility; |
| | Yadav (2020)[42] | Married women in slums | India | Cross-sectional study | Quantitative | Unmet need for family planning services | Age; educational status; duration of marriage; number of pregnancies; knowledge of contraceptive methods; opposition to contraceptive use; contact with a midwife |
| | Razzaque (2020)[66] | Slum residents | Bangladeshi | Cross-sectional study | Quantitative | Healthcare utilisation | Recent migration; wealth; education; employment |
| | Getachew (2020)[113] | Slum households | Ethiopia | Cross-sectional study | Quantitative | Delivery in healthcare facilities | Perceived as not customary to deliver at health facility; not necessary; unavailability of female birth attendants; perceived quality of services; cost |
| | Shrestha (2019)[61] | Mothers with infant residing in slums | Nepal | Cross-sectional study | Quantitative | Utilisation of antenatal and delivery services | Educational status of respondents and their husbands; number of pregnancy |
| | | | | | | Institutional delivery | Educational status; occupation of husband; number of pregnancy |

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| | | | | | Postnatal visit | Occupation of husband |
| | | | | | Utilisation of family planning services | Occupation of husband |
| | | | | | Tetanus Toxoid immunisation | Educational status of respondents; economic status; knowledge about healthcare services; educational status of husband; number of pregnancies |
| Atusiimire (2019)[98] | Mothers delivered in the past one year in slums | Uganda | Cross-sectional study | Quantitative | Facility based deliveries | Exposure to media concerning facility delivery; frequency of ANC; timing of 1st ANC |
| Upadhyai (2019)[39] | Recently delivered mothers residing in slums | India | Cross-sectional study | Quantitative | Healthcare utilisation | Age; education of mother and father; socioeconomic class; antenatal check-ups; institutional delivery services; family type; caesarean delivery; complication or perceived health problem |
| Angeles* (2019)[47] | Slum and non-slum residents | Bangladesh | Prospective study | Quantitative | Use of modern contraceptive methods | Parity, mother's age; mother's education, socioeconomic status, interaction (slum × time period) |
| | | | | | Delivery by skilled birth attendant | Residing in slums, parity, mother's age, mother's education, length of stay in current city of residence, socioeconomic status, number of available community health worker, distance from health facility, interaction (slum x time period) |
| Kusuma (2018)[80] | Recent migrant and settled mothers with a child up to the age of 1 year in slums | India | Cross-sectional study | Quantitative | Birth in health facility | Listening to radio; number of ANC visits; plan for hospital birth; plan for transport; some danger sign; knowledge of danger sign |

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| Sharma (2018)[138] | Women living in urban slums and delivered a baby within 1 year | India | Cross-sectional study | Quantitative | Utilisation of maternal care services | Mode of delivery; hospital stay after delivery |
| Islam* (2018) [107] | Ever-married women aged 15-49 years living in slum and non-slum | Bangladesh | Cross-sectional study | Quantitative | ANC visits | Education; wealth index of the household |
| Geddam (2017)[67] | Rural to urban internal migrant mothers with a child of less than 2 years of age | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education of the mother; family size; occupation of mother |
| | | | | | Delivery in institution | Educational status of mother; number of ANC visit; adequacy of ANC; migration status |
| Kaba (2017)[94] | Stakeholders including city administrators, community members, healthcare providers | Ethiopia | Cross-sectional study | Qualitative | Maternal health service utilisation | Lack of awareness and lack of perceived needs about available services; fear of stigma; competing priorities, social connectedness; perceived lack of respectful service providers; socio-cultural factors including socially sanctioned expectations |
| Verma (2017)[75] | Pregnant women and infants in slums | India | Case-control study | Mixed-method | Antenatal care registration/immunisation | Knowledge of healthcare services; perceived need for healthcare services; family support; fear; negative experience with previous vaccination |
| Sharma (2016)[51] | Married women in slums | Nepal | Cross-sectional study | Quantitative | Antenatal healthcare utilisation | Age; husband education; spouse occupation; family income; type of family; planned pregnancy; death of children |
| Jolly (2016)[108] | Married women with a pregnancy outcome in the previous year in slums | Bangladesh | Cross-sectional study | Quantitative | Antenatal care; birth assisted by medically trained provider; postnatal care; treatment seeking for | Education; wealth |

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| | | | | | | delivery complications | |
| | | | | | | Use of modern family planning | Wealth |
| | Tebekaw (2016)[117] | Women in slums | Ethiopia | Cross-sectional study | Quantitative | Antenatal care services | Education; private/public hospital |
| | Sadhna (2016)[109] | Married women in slums | India | Cross-sectional study | Quantitative | Utilisation of maternal health services | Education; Caste; wealth; distance to preferred health facility |
| | Neyaz (2016)[62] | Married women in slums | India | Cross-sectional study | Quantitative | Delivery in hospitals | Received ANC; number of ANC visits; education; birth order; living index |
| | Rahman (2016)[105] | Married women in rural and slum area | India | Cross-sectional study | Quantitative | Intrauterine contraceptive device utilisation | Income; occupation |
| | Sheehy (2016)[103] | Informant and women in slums | Myanmar | Cross-sectional study | Qualitative | Giving birth in hospital | Financial constraints; lack of transportation; sociocultural and financial considerations |
| Contraceptive | Renzaho (2017)[48] | Slum residents aged 13-24 | Uganda | Cross-sectional study | Quantitative | Access to contraceptive services and family planning | Age; disability |
| | Abd El Fatah (2019)[136] | Married women aged 15–49 years in slums | Egypt | Cross-sectional study | Quantitative | Contraceptive use | Number of male children |
| Health insurance | Iyalomhe (2021)[41] | Slum residents | Nigeria | Cross-sectional study | Quantitative | Healthcare insurance coverage | Age; sex; marriage; income; religion; education |
| | Mendhe (2021)[40] | Female slum residens | India | Cross-sectional study | Quantitative | Healthcare insurance coverage | Socioeconomic status; |
| | | | | | | Out of pocket expenditure | Age; government/ private hospital |
| | Otieno (2019)[84] | Slum residents | Kenya | Cross-sectional study | Quantitative | Enrolment in a health insurance programme | Employment; source of primary care; satisfaction with cost of care; satisfaction with procedure of care; perceived health status |
| | Kusuma (2018)[69] | Slum residents | India | Cross- | Quantitative | Health insurance | Residential background (old |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | sectional study | | possession | slums than new); migration period; possession of ration card; household size; occupation of household head |
| | Gupta (2017)[95] | Slum households having health insurance cards | India | Cross-sectional study | Mixed-method | Utilisation of healthcare insurance | Awareness of the empanelled hospitals; experiences of friends and relatives at national health insurance empanelled hospitals; hospitals refused to accept health insurance cards |
| Expenditure | Sahu (2017)[63] | Women delivered within a period of 6 weeks in slums | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure for maternal and neonatal health services | Gravidity; type of delivery; place of delivery; morbidity |
| | Mishra (2017)[59] | Slum households with a child aged 0–14 years and who had migrated within the last 12 years | India | Cross-sectional study | Quantitative | Out-of-pocket expenditure | Child's gender; mother's education; type of illness |

*Factors reported in the study were associated with participants covering both slum and non-slum residents. ANC: antenatal care; CVD: cardiovascular disease; HIV: human immunodeficiency virus; N/A: not applicable; NGO: non-governmental organization; TB: tuberculosis.

Supplement 3. Provision of healthcare services in slums examined by included studies and associated factors

| Subcategory | Author (year) | Participants | Country | Study design | Methodology | Outcome | Factors of interest |
|---|---|---|---|---|---|---|---|
| General provision | Banerjee (2021)[145] | Community-level service providers in the selected city of Nagpur, Maharashtra. | India | Cross-sectional study | Mixed-methods | Implementing urban health and nutrition day | Unserved areas and left-out urban slum pockets; the distribution paradox of Urban Health and Nutrition Day location with an ill-defined geographic boundary; restriction of range of services to antenatal registration and immunisation with gross neglect of other components; suboptimal training of staff; insufficient availability of space, logistics, and health manpower; non-involvement of community members and Urban Local Bodies; and poor monitoring and supervision. |
| | Muhammad (2021)[129] | Caregivers of children, community influencers, immunisation staff in peri-urban slums | Pakistan | Cross-sectional study | Mixed-method | Childhood vaccination | Underperformance of staff; unreliable immunisation and household data; inefficient utilization of funds; interference of polio campaigns with immunisation |
| | Kaba (2020)[74] | Stakeholders (community members, community opinion leaders, Urban Health Extension Professionals, and | Ethiopia | Cross-sectional study | Qualitative | Provision of health services | Institutional-level: medical supplies; a lack of passion; attitudes on the part of health service providers<br><br>Community level: shared understanding of the |

| | | | | | | |
|---|---|---|---|---|---|---|
| | city health office representatives.) | | | | | problems; services and the community's established values in relation to the problems and services. |
| Das Gupta (2020)[143] | N/A | India | Case study | Mixed-method | Improving public health services | Devolution of service delivery transferring funds and responsibilities to elected local bodies; management by professional managerial and technical cadres; Tight organisation of public health services; Professional support from the state directorate of public health |
| Ongarora (2019)[146] | Private healthcare facilities | Kenya | Cross-sectional study | Quantitative | Provision of medicine | Medicine price, affordability and availability of medicine |
| Agonigi (2018)[142] | Health professionals | Brazil | Cross-sectional study | Qualitative | Production of care in the daily work of health professionals | Issues related to assignment of tasks; inadequate space and equipment; requirement to follow standardised protocol; demands from the management; workload; environment (sanitation, territory); violence; registration |
| Odhiambo (2016)[140] | Community health workers | Kenya | Longitudinal study | Quantitative | Drug administration activities for schistosomiasis | Community health worker familiarity with households led to warm reception; good knowledge of intervention area by community health workers; high demand for drugs in the final year of treatment; effective community mobilization; opportunity to integrate mass drug administration with other health interventions; presence of community health workers and their supervisory structure, and |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | points of referral for serious side effects; fear of side effects, size of tablet and misconceptions regarding treatment; unrelated death and the associated negative publicity by the media; religious beliefs and mistrust of interventions; insufficient time; absence of community members during the drug administration exercise; difficulty in directly observing treatment; unsanitary environmental conditions; inaccessibility (filthy and bush environment); demand for incentives by community members to take drugs. |
| Patil (2016)[141] | Healthcare service centres | India | Cross-sectional study | Quantitative | Services provided under Integrated Child Development Services | Lack of basic infrastructural facilities; absence of essential drugs, equipment and logistics; poor pay scale, untimely drug supply, poor community support, more of documentation work, increased work burden, lack of supportive staff and no incentives for the increased work |
| Mataboge (2016)[133] | Health services' clients and healthcare providers in an informal settlement | South Africa | Cross-sectional study | Qualitative | Provision of reproductive healthcare services | Healthcare policies; work overload; community-based care |
| Prado Junior (2016)[144] | New TB cases living in slum and non-slum | Brazil | Cross-sectional study | Quantitative | Coverage under Family Health system for TB patients | Policy prioritizing low social development areas |

TB: tuberculosis

Appendix 1. Search strategy and the result of each database.

| Database | Search strategy | Number of studies |
|---|---|---|
| Ovid Medline | 1. (informal* and settlement*).ti,ab,kw.<br>2. (shanty and town*).ti,ab,kw.<br>3. (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4. or/1-3<br>5. limit 4 to english language | 4,688 |
| Embase | 1 (informal* and settlement*).ti,ab,kw.<br>2 (shanty and town*).ti,ab,kw.<br>3 (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4 or/1-3<br>5 limit 4 to english language | 5,090 |
| Web of Science | 1 (TS=(favela* OR ghetto* OR shantytown* OR shanty-town* OR slum OR slums)) AND language: (English)<br>2 ((TS=(informal* NEAR settlement*))) AND language: (English)<br>3 (TS=(shanty NEAR town*)) AND language: (English)<br>4 (#1 OR #2 OR #3) AND language: (English) | 3,553 |
| Cochrane | 1 (informal* and settlement*).ti,ab,kw.<br>2 (shanty and town*).ti,ab,kw.<br>3 (favela* or ghetto* or shantytown* or shanty-town* or slum or slums).ti,ab,kw.<br>4 #1 or #2 or #3 | 381 |
| CINAHL | 1 TI ( informal* and settlement* ) OR AB ( informal* and settlement* )<br>2 TI ( shanty and town* ) OR AB ( shanty and town* )<br>3 TI ( favela* or ghetto* or shantytown* or shanty-town* or slum or slums ) OR AB ( favela* or ghetto* or shantytown* or shanty-town* or slum or slums )<br>S1 OR S2 OR S3 | 1,757 |

**Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist**

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| **TITLE** | | | |
| Title | 1 | Identify the report as a scoping review. | 1 |
| **ABSTRACT** | | | |
| Structured summary | 2 | Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives. | 2 |
| **INTRODUCTION** | | | |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach. | 4 |
| Objectives | 4 | Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives. | 5 |
| **METHODS** | | | |
| Protocol and registration | 5 | Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number. | 5 |
| Eligibility criteria | 6 | Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale. | 6-7 |
| Information sources* | 7 | Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed. | 5-6 |
| Search | 8 | Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated. | 5-6, appendix1 |
| Selection of sources of evidence† | 9 | State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review. | 5-7 |
| Data charting process‡ | 10 | Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators. | 7-9 |
| Data items | 11 | List and define all variables for which data were sought and any assumptions and simplifications made. | 7-9 |
| Critical appraisal of individual sources of evidence§ | 12 | If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate). | N/A |

| SECTION | ITEM | PRISMA-ScR CHECKLIST ITEM | REPORTED ON PAGE # |
|---|---|---|---|
| Synthesis of results | 13 | Describe the methods of handling and summarizing the data that were charted. | 7-9 |
| **RESULTS** | | | |
| Selection of sources of evidence | 14 | Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram. | 10-11, Figure 1 |
| Characteristics of sources of evidence | 15 | For each source of evidence, present characteristics for which data were charted and provide the citations. | Supplement 1-3 |
| Critical appraisal within sources of evidence | 16 | If done, present data on critical appraisal of included sources of evidence (see item 12). | N/A |
| Results of individual sources of evidence | 17 | For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives. | Table 2-3 |
| Synthesis of results | 18 | Summarize and/or present the charting results as they relate to the review questions and objectives. | 13-25, Figure 2 |
| **DISCUSSION** | | | |
| Summary of evidence | 19 | Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups. | 29-30 |
| Limitations | 20 | Discuss the limitations of the scoping review process. | 31 |
| Conclusions | 21 | Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps. | 34 |
| **FUNDING** | | | |
| Funding | 22 | Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review. | 35-36 |

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

*From:* Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.