Primary Care in LMIC Cities 1

Supply-side and demand-side factors affecting allopathic primary care service delivery in low-income and middle-income country cities

Richard J Lilford, Benjamin Daniels*, Barbara McPake, Zulfiqar A Bhutta, Robert Mash, Frances Griffiths, Akinyinka Omigbodun, Elzo Pereira Pinto Jr, Radhika Jain, Gershim Asiki, Eika Webb, Katie Scandrett, Peter J Chilton, Jo Sartori, Yen-Fu Chen, Peter Waiswa, Alex Ezeh, Catherine Kyobutungi, Gabriel M Leung, Cristani Machado, Kabir Sheikh, Sam I Watson, Jishnu Das*

Most people in low-income and middle-income countries (LMICs) now live in cities, as opposed to rural areas where access to care and provider choice is limited. Urban health-care provision is organised on very different patterns to those of rural care. We synthesise global evidence to show that health-care clinics are plentiful and easily accessible in LMIC cities and that they are seldom overcrowded. The costs that patients incur when they seek care are highly variable and driven mostly by drugs and diagnostics. We show that citizens have agency, often bypassing cheaper facilities to access preferred providers. Primary care service delivery in cities is thus best characterised as a market with a diverse range of private and public providers, where patients make active choices based on price, quality, and access. However, this market does not deliver high-quality consultations on average and does not provide continuity or integration of services for preventive care or long-term conditions. Since prices play a key role in accessing care, the most vulnerable groups of the urban population often remain unprotected.

Introduction

Health outcomes have improved greatly over the last few decades, even in low-income countries. Child mortality in Kenya declined from 111 to 39 per 1000 between 1995 and 2020,[1] as gross domestic product (GDP) per capita increased from US$1800 to $4800 (purchasing power parity).[2] For comparison, child mortality in the UK fell from 112 per 1000 in 1925 to 28 per 1000 in 1960,[3] as GDP per capita increased from £5000 to £10 000 (2013 GDP)[4]—a similar reduction over a similar time period, but which required more than twice as much real income as in modern Kenya. These gains reflect the successes of public health and vertical programmes, such as for maternal and child health, HIV/AIDS programmes, and other infectious disease control efforts. However, non-communicable diseases, such as cardiovascular disease, cancer, and mental health disorders, now contribute the greatest burden in terms of loss of years of healthy life in low-income and middle-income countries (LMICs).[5] These diseases require ongoing, rather than episodic, care and they often occur in combination with each other and with communicable diseases, such as HIV and tuberculosis. To deal with these challenges, it is essential to strengthen primary care systems. Following decades of campaigning and a series of WHO consensus statements, there are signs that the emphasis is shifting in this direction.[6,7] Comprehensive primary care services are now seen as essential to improving health and health equity worldwide. Consequently, most countries have formally committed to working towards universal health coverage, thereby motivating the funding and development of high-quality primary care services.

This Series of two papers is about primary care services in LMIC cities. Cities are now home to over half of all people in LMICs—a proportion that is predicted to rise to 68% by 2050.[8] Cities present very different

Key messages

- Large cities in low-income and middle-income countries are characterised by a dense network of primary care provider clinics, such that the travel time to reach the chosen provider is typically less than 30 min.
- Patient volumes per clinic and per clinician are low, with some exceptions, especially hospital polyclinics (general outpatient walk-in clinics).
- Out-of-pocket expenditure relates mostly to medicines and tests, rather than consultations, in both public and private settings.
- The average quality of care is poor in terms of making the right diagnosis and providing the correct management for the diagnosis made, but there are exceptions.
- Service users exhibit considerable agency, travelling further and paying more to visit providers of higher perceived quality; polyclinics are particularly favoured.
- The observation that people actively choose among multiple providers implies the existence of a market in primary health care, whereas the poor general quality of services indicates a degree of market failure.
- Although primary care service provision is well studied in large cities, there is little information from towns and periurban areas, with some indication that the situation regarding multiple, accessible provider clinics is different there.

Lancet Global Health 2025; 13: e942–53

See **Comment** page e795

*Joint first authors

This is the first in a **Series** of two papers about primary care in LMIC cities

Institute of Applied Health Research, University of Birmingham, Edgbaston, UK (Prof R J Lilford PhD, K Scandrett MSc, P J Chilton BSc, J Sartori BA, S I Watson PhD); **Department of Global Health and Population, Harvard T H Chan School of Public Health, Boston, MA, USA** (B Daniels MSc); **The University of Melbourne, Parkville, VIC, Australia** (Prof B McPake PhD); **Institute for Global Health & Development, The Aga Khan University, South-Central Asia, East Africa, and UK, Karachi, Pakistan** (Z A Bhutta PhD); **Centre for Global Child Health, The Hospital for Sick Children, Toronto, ON, Canada** (Z A Bhutta); **Department of Family & Emergency Medicine, University of Stellenbosch, Cape Town, South Africa** (Prof R Mash PhD); **Warwick Medical School, University of Warwick, Coventry, UK** (Prof F Griffiths PhD, Y-F Chen PhD); **Centre for Health Policy, School of Public Health, University of the Witwatersrand, Johannesburg, South Africa** (Prof F Griffiths); **College of Medicine, University of Ibadan, Ibadan, Nigeria** (A Omigbodun MD); **Center of Data and Knowledge Integration for Health, Oswaldo Cruz Foundation–Brazil, Salvador, Brazil** (E P Pinto Jr PhD); **Global Business School for Health, University College London, London, UK** (R Jain ScD); **African Population and Health**

Research Center, Nairobi, Kenya (G Asiki PhD, C Kyobutungi PhD); **University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK** (E Webb MBBS); **School of Public Health, College of Health Sciences, Makerere University, Kampala, Uganda** (Prof P Waiswa PhD); **Dornsife School of Public Health, Drexel University, Philadelphia, PA, USA** (Prof A Ezeh PhD, Prof K Sheikh PhD); **School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong Special Administrative Region, China** (Prof G M Leung MD); **Sergio Arouca National School of Public Health, Oswaldo Cruz Foundation, Rio de Janeiro, Brazil** (Prof C Machado PhD); **McCourt School of Public Policy and the Walsh School of Foreign Service, Georgetown University, Washington, DC, USA** (Prof J Das PhD)

Correspondence to: Prof Richard J Lilford, Institute of Applied Health Research, University of Birmingham, Edgbaston B15 2TT, UK
r.j.lilford@bham.ac.uk

See **Online** for appendix

***Panel 1*: Search strategy and selection criteria**

We conducted the following three pieces of work:

First, a compilation of existing systematic reviews of primary care services in low-income and middle-income countries (LMICs). We compiled existing systematic and scoping reviews from MEDLINE in April, from January, 1946 to April, 2024, augmented by relevant WHO reports of which we were aware. We describe our approach in more detail in the appendix (p 2), where we also list the 54 reviews included.

Second, a scoping review on the configuration of urban primary care services in LMICs (appendix p 11). The review tackled eight questions: (1) What are the travelling times to access primary care service facilities? (2) How are health-care facilities distributed relative to population density? (3) Where are primary care service facilities located relative to population need? In other words, what is the accessibility of primary care service facilities? (4) How are doctors, nurses, and clinical officers distributed among facilities or relative to population density? (5) What is the private versus public mix of primary health-care services available to patients? (6) What are the charges for services including medications? (7) What infrastructure, technology, and products (eg, medicines, equipment, and buildings) are available? (8) What is the distribution of dental services, pharmacies, and drug stores, and specific community-based maternity care?

Third, we build on a World Bank Service Delivery Indicators dataset covering ten countries in sub-Saharan Africa.[9] In a previous study we used this dataset to examine quality of primary care service provision, staffing, and workloads.[10] This latter study covers urban and rural locations. We re-analysed this dataset to examine specifically urban locations. We extracted data on facility staffing, caseload, and usage for 4416 providers at 2216 urban health facilities in the ten countries. For this re-analysis, we compiled rosters of all staff, regardless of professional cadre, who were reported as attending to outpatients and calculated the average daily workload per provider, assuming 20 working days per provider per month. We recognise that these findings might not fully represent findings outside Africa, but were unable to source similar data in other LMIC settings. Within sub-Saharan Africa, the service delivery indicator surveys are nationally representative including cities of all shapes and sizes. They also correlate with DHIS2 surveys.[11]

We present our conclusions based on the bulk of the evidence, especially those from large multicountry surveys and systematic reviews, recognising that there are exceptions. The data underpinning our findings derive from the above three sources, supplemented in places by personal knowledge of individual studies. We collated and narratively synthesised studies with the existing literature on management science and economic theory to develop an understanding of underlying mechanisms.[12,13]

challenges and opportunities compared with rural settings, where there are few choices of health-care provider. In the first paper in this Series, we synthesise and analyse (panel 1) the literature on primary care services in LMICs, aiming to describe the typical configuration of these services in LMIC cities, the out-of-pocket expenses of attending them, the quality of care provided, and whether patients attend the nearest or cheapest service. In the second paper in this Series, we build on these observations, evidence, and theory to discuss policy and service interventions to improve the quality of primary care services.

In this Series, we examine improvement of delivery of primary care services to individuals, rather than to communities and populations. Services such as water, sanitation, hygiene, air quality, food policy, or transport infrastructure are important determinants of health. However, as they target populations and communities, rather than individuals, they are out of our scope.[14] We, therefore, refer throughout to primary care services, rather than primary health care.[15,16] With respect to primary care services, we are concerned with diagnosis and treatment of acute and chronic conditions, rehabilitation, palliative care, and prevention through activities such as vaccination, case finding, and health promotion. We are also concerned with person-centredness, first contact access, continuity, coordination, and comprehensiveness of care.[17] We include primary care services in general hospital outpatient departments (also known as hospital polyclinics), in line with the WHO Alma-Ata Declaration of 1978.[15]

We specifically address allopathic (biomedical) primary care delivered in facilities or in the community as provided by doctors, nurses, other health professionals (eg, clinical officers, physician associates, dentists, and pharmacists), and community health workers. We acknowledge that a substantial amount of care activities also occur in traditional medicine and other non-allopathic sectors in LMICs, albeit in less well documented ways, but these fall outside the scope of this Series.[18–22]

Finally, we acknowledge that primary care services in LMIC cities cover a wide range of contexts. Cities come in many different forms (eg, large and small), and they exist in the context of countries at very different stages of economic development. Thus, we draw out these distinctions wherever they exist, but as described later, the bulk of evidence relates to large cities rather than towns and peri-urban areas. Likewise, the modern city involves a number of overlapping jurisdictions and

competing stakeholders, which include the national government, city authorities, municipal corporations, local governments, international organisations and non-governmental organisations, and private actors of all types. We do not have the scope in this Series to discuss the politics and political economy of these interactions, but acknowledge their importance in putting new policies into effect. In the second paper in this Series, we discuss the implications for policy, acknowledging that our findings are relevant to diverse types of policy-making configurations in different ways. We describe our methods in panel 1.

Patterns of service availability in primary care

Density, provider type, and accessibility

One of the most striking and consistent findings across all settings is the profusion of diverse clinical outlets offering primary care services to the public, even in the most deprived areas of LMIC cities. For example, Kampala, Uganda, has 832 registered walk-in primary care clinics for a population of approximately 2·7 million,[23] and Dhaka, Bangladesh, has over 1000 health service delivery points (including both pharmacists and clinicians, many unqualified).[24] This pattern was illustrated in a large-scale study—henceforth, the seven slums study—of primary care clinics in and around seven slums across four countries (Nigeria, Pakistan, Kenya, and Bangladesh)[25,26]—and our study based on the World Bank's Service Delivery Indicators programme (panel 1).[10] The presence of large numbers of clinics scattered throughout LMIC cities is corroborated by the results of our new scoping review (appendix p 11). We illustrate this pattern with respect to Ibadan, Nigeria and Dhaka, Bangladesh in the appendix (p 62).

The types of facilities and their characteristics are diverse in every setting, ranging from solo practices to hospital general outpatient departments (ie, polyclinics), clinics with differing opening times of the day or week, and clinics staffed by different staff mixes of doctors, nurses, paramedical staff, or even unqualified providers. In addition, a variety of unlicensed or unregistered clinics provide similar services alongside qualified and formally registered providers of allopathic (biomedical) care; where observed, it is unclear whether clients know or care that such providers are informal or unqualified.[27,28] There are also wide variations in patterns of facility organisation. For example, solo practices staffed by a doctor or nurse are almost absent in Kenya and Nigeria, but account for about a quarter of adult clinic visits in urban slums in Bangladesh and Pakistan.[25]

The density of facilities is such that most people living in LMIC cities can reach the clinic or hospital outpatient departments they choose within much shorter time periods than those in rural areas.[29,30] The median time for people living in seven African and Asian slums to reach the doctor or nurse clinic of their choice was 15–30 min, despite the fact that many people bypassed the nearest facility.[25] In Delhi, India, for instance, researchers found 70 clinics within a 15-min walking distance of the four neighbourhoods they studied.[31] Similarly, short travel time to clinics has been reported from slums in Haiti,[32] Ethiopia,[33] and Iran.[34] Short travel times in LMIC cities is further confirmed by our new scoping review—in Batna, Algeria, 88% of residents could walk to at least one clinic within 30 min, as could 48% of people in Blantyre, Malawi (appendix p 11).

Usage rates and staff–patient ratios

Usage rates are typically presented as the number of visits to a primary care provider (nurse, clinical officer, or doctor) per year, obtained, if necessary, by multiplication from shorter recall periods in surveys. However, recorded rates are higher when the period of recall is short (eg, a month) than when it is longer (eg, a year).[35] For example, in the seven slums study, survey participants reported 1·1 visits per year to a doctor or nurse clinic in Nairobi, Kenya, and 1·5 visits per year in Dhaka, where recall was 1 year.[25] In Delhi, however, where the recall period was varied experimentally from 1 month to 1 week, the yearly calculated rate doubled from three to six visits.[35] The latter figure is similar to care-seeking rates in the USA,[36] suggesting that, on average, LMIC city dwellers can and do access primary care when they fall ill. However, 94–98% of doctor and nurse consultations, and the majority of pharmacy visits, were for acute symptoms (pain or fever) in the seven slums study.[25] Late presentation of cancer and the poor management of chronic disease suggest a substantive gap in obtaining some types of care.[37,38]

It might be supposed, based on need, population size, and the above data on usage, that facilities are overcrowded and understaffed. However, the data do not support this theory. Using provider rosters and reported patient numbers in our previous study,[10] we calculated daily outpatient caseloads for all facilities and provider types in urban areas in the ten countries. Figure 1 shows the distribution of caseloads by country. The median provider served no more than 15 patients per day in each country, and very few facilities reported providers seeing more than 25 patients per day. These patient numbers imply that—as long as all providers listed as serving outpatients are working somewhere full-time—only the very busiest providers face more than a 4-h daily outpatient workload, based on estimates of average outpatient consultation times, which across the literature are no longer than 15 min per patient.[40] Although this figure could be an underestimate, the high degree of absenteeism or task shifting that would be required to bring the average facility to more than a 4-h workload is, we believe, very unlikely.

Figure 2 illustrates the relationship between facility size (number of providers attending to outpatients) and patient loads across all ten countries. Although there is some variation across provider type, the results highlight

the consistently low overall provider outpatient caseload among most facilities—the 75th percentile provider never exceeds 20 outpatients daily, no matter the sector nor the facility size. This finding implies that facility staffing generally scales with total patient load. Similar patterns were observed in a representative survey of Viet Nam.[41] However, low average workloads mask massive workloads in some clinics. For instance, in many places, hospital polyclinics are much more popular than small clinics, and have much longer waiting times, as seen in a 2022 study in India (and commensurate with consumer choice).[42] Likewise, in some countries, such as China, patients who would otherwise attend primary care have direct access to specialist clinics that can then become very overcrowded with providers seeing over 100 people in a day.[43]

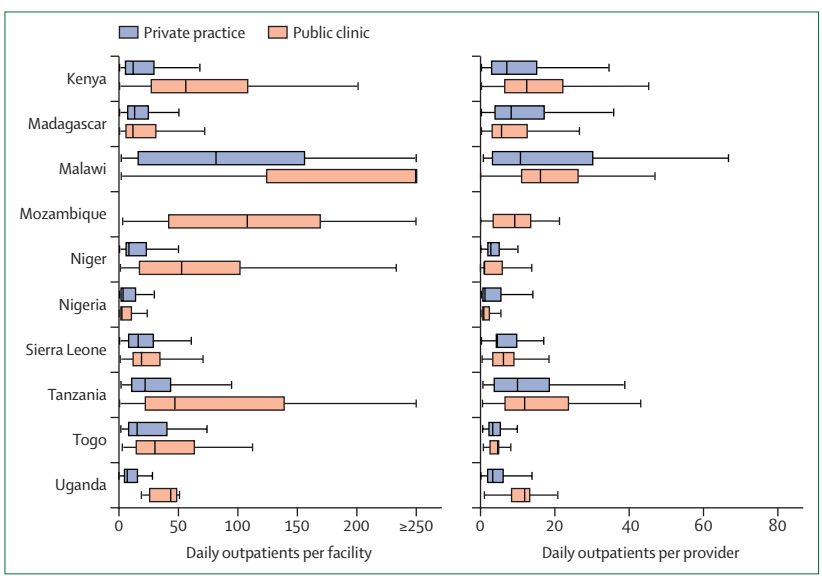

Figure 1: **Distribution of daily outpatient caseload across urban SSA facilities and providers**
Data reported by urban facilities from a nationally representative survey across ten SSA countries[10] (Guinea-Bissau was excluded due to insufficient data). The left-hand plot presents outpatient load per facility; right-hand plot presents outpatient load divided evenly among all providers reported as seeing outpatients. Bold vertical lines represent the median, ends of boxes represent 25th and 75th percentiles, and whiskers indicate last inside values.[39] Facilities reporting more than 250 outpatients per day are top-coded. Data are unweighted. Outside values are excluded. SSA=sub-Saharan Africa.

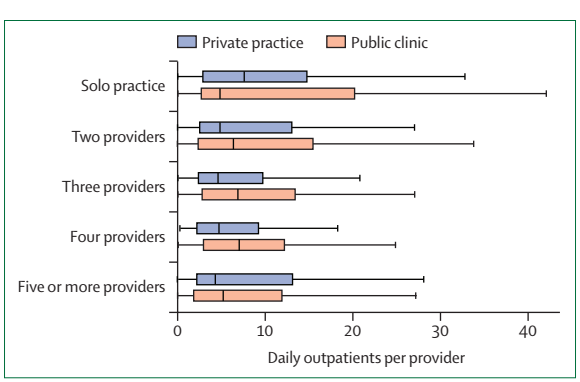

Figure 2: **Daily outpatient caseload across facilities and providers in urban SSA, by facility sector and size**
Data are based on urban areas within the ten SSA countries.[10] Data are pooled and weighted equally by country. Facilities are classified on the vertical axis by the number of providers reported as serving outpatients; the horizontal axis presents the number of daily outpatients per provider, calculated by dividing patients evenly among the total number of providers at each facility. Each box illustrates the median provider (bold vertical line), the 25th and 75th percentiles (box), and the upper adjacent values (endcaps) as the last value within 1·5 times the IQR length from the upper quartile as defined by Tukey.[39]
SSA=sub-Saharan Africa.

Variation across environments, stages of development, and marginalisation of individuals

Most of the findings described above emanate from cities with a population of over a million, low-middle-income countries and to a lesser extent low-income countries, and people accessed in surveys in which those who are experiencing homelessness and those who are unregistered are under-represented.

The extent to which the above findings can be extrapolated to contexts with lower population density is limited due to incomplete mapping of provision.[44] A study from Malawi confirmed large numbers of clinics in the main cities, but found many fewer in smaller towns.[45] Studies in Batna, Algeria,[46] Shenzhen, China,[47] and in Sierra Leone and Liberia[48] all show that travel times to clinics increase with distance from the city centre towards peri-urban areas.

In upper-middle-income countries, health systems often appear more centrally organised, typically with larger public sector primary care networks, than in low-income and low-middle-income countries. For example, both Brazil and South Africa (upper-middle-income countries) provide free care through primary care clinics, where teams of six to ten community health workers are supported by a nurse or doctor to provide primary care to a defined geographical community of approximately 10 000 people.[49–54] Following large-scale reforms in 2001, China has also invested heavily in community health centres, providing free consultations and medicines at cost.[55,56]

Finally, although LMIC cities feature very high rates of economic inequality, we note that people with low income (such as those living in slums) are not necessarily the most marginalised city dwellers with respect to primary care access. Unhoused people, including street children, have more difficulty accessing services,[57–61] and have higher morbidity in terms of infectious illness, mental health, and reproductive health according to a systematic review.[62] Such people are under-represented in surveys.[63] Migrant groups, including internal rural-to-urban migrants,[64] but in particular international migrants, are another especially vulnerable group, and their vulnerability is exacerbated by discrimination,[65,66] even when they have a constitutional right to health care. For example, the 2023 National Health Insurance Bill in South Africa[67] only provides emergency care and treatment for HIV, tuberculosis, and malaria for undocumented migrants, who have to rely on philanthropic services to receive general primary care

services.[68] However, empirical information on these populations is very sparse, particularly when it comes to intersectional vulnerabilities in LMICs,[69] and is a crucial area for future work.

Patterns of cost and expenditure in primary care

Costs that fall on patients comprise direct (out-of-pocket) costs for health care (eg, consultations, medicines, and diagnostics), transport, and indirect costs (eg, lost earnings). A broad literature has investigated total health-care costs.[70,71] There is less evidence for the prices of individual primary care interactions. In the seven slums study, out-of-pocket costs per interaction in 2019 ranged from INT$21 to $82 (local currency equivalent to US$21–82 worth of consumption at US prices).[25] The median out-of-pocket expenditure for a clinic visit was under 10% of total monthly household expenditure, but the distribution of these costs was skewed, such that over 33% of visits cost more than one-third of monthly household expenditures in three of the five study countries. Medication costs accounted for the bulk of these; 67–100% of the median proportion of the total cost of a visit was accounted for by medicines. For patients requiring repeat or chronic care, the structure of these costs might be somewhat different than for acute care.

Economically poor people living in cities have high expenses in meeting their basic needs for food, housing, and transport, often leaving little headroom for health care, where costs can become catastrophic,[72] especially if there are ongoing costs for treatment of long-term conditions. Although consultations are free in some public institutions, medicines are usually not. Some middle-income countries have been able to ameliorate these costs; for example, 45% of the Brazilian population obtains free medication for hypertension and 51% for diabetes through the Brazilian Popular Pharmacy Program.[73,74]

A large amount of literature attests to the twin problems of high cost and shortages of medicines across LMIC settings as a whole.[75,76] In some countries (largely low-income countries) the cost of vaccines is met by donors such as Gavi, the Vaccine Alliance, but their supply can still be very precarious across large numbers of poorly organised clinics that have poor stock control and difficulty maintaining the cold chain.[77] Costs also emerged as the main barrier to dental care in LMIC cities,[78] resulting in poor dental health,[79] particularly in slums.[80]

Patterns of quality in primary care

Framework for clinical care

There are many dimensions to the quality of care received by the patient—for example, quality of diagnosis and clinician's attitude. In addition, there are many upstream determinants of care that can affect the care received (figure 3).

Routine quality assessment methodologies rely heavily on observations of determinants, often combined with service user feedback.[83] Measuring the quality of patient-facing primary care services is not straightforward. Routinely measured health outcomes are insufficient for this purpose, since they are imprecise and biased; they do not reflect the counterfactual outcomes in the absence of the primary care services.[84] Medical records are also seldom available, particularly in fragmented urban landscapes, and typically contain little detail. Alternative, but more labour-intensive, measures are described in panel 2.

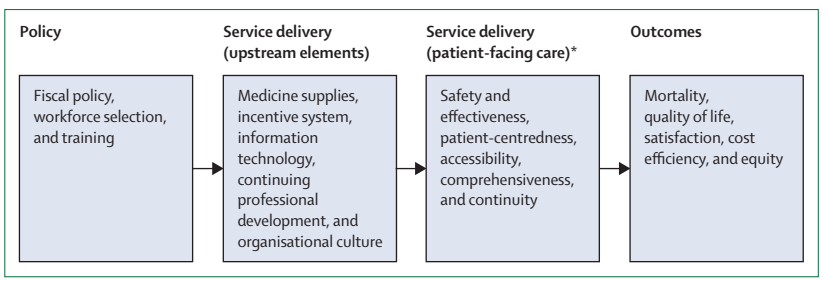

Figure 3: **Dimensions of care and their determinants**
Adapted from Lilford and colleagues.[81] *Based on US Institute of Medicine definitions.[82]

A consistent finding from the literature is that the average quality of primary care consultations is poor in LMICs.[28,90–95] A review of nine studies covering India, China, Kenya, Senegal, South Africa, and Uganda found that, typically, fewer than half of providers successfully diagnosed or treated common tracer conditions when presented by standardised patients.[96] In addition to providers' abilities to adequately manage patients, the unavailability of necessary medications, the sale and use of non-prescribed antibiotics, and the overprescription of unnecessary antibiotics is a particularly common theme in the literature on low-quality care,[97–99] explored in a systematic review and meta-analysis of 48 studies from 27 LMICs,[90] a review from Asia,[100] and a systematic review from China.[101]

Coordination and continuity of patient care

One of the crucial areas where quality of care can fall short is in the area of coordination and standardised referral pathways—who does a community health worker refer to if they find a patient who is malnourished or has not been vaccinated? Who will provide care following discharge? Where will the patient be referred if they might have severe disease? Who will provide continuity of care for people with hypertension, diabetes, or terminal disease? These are the problems the modern health services face, particularly in cities where care is fragmented. For example, in many settings, hypertension is not only largely undiagnosed,[102–104] but also undertreated when diagnosed,[37,105] and tuberculosis and cancer are often diagnosed at late stages.[106–109] Part of the treatment delay can be explained by delays in the health-care system itself, since numerous studies have identified that patients are badly directed following the initial consultation and are delayed in navigating the system to receive definitive treatment.[110–114]

Panel 2: Four methods to directly measure the quality of primary care consultation

Four direct measurement methods are commonly described in the literature.[85–87]

- Medical vignettes, measuring provider knowledge of high-quality management, including questions, tests, and medications, for key tracer conditions benchmarked against international and national standards of care.[88] These do not account for the well documented know–do gap between knowledge and practice.
- Direct observations of real-time care-seeker and health worker encounters, allowing evaluation of actual provider behaviour in response to the care-seeker's presentation, but that depend on the range of presenting conditions encountered, which might vary systematically across providers and do not allow researchers to evaluate the care relative to what the patient needed.
- Exit interviews, where care-seekers give an account of the content of their encounter with health workers and their assessment of the experience. Subject to recall inaccuracies and expectations of quality when compared directly with observations and are again limited by the range of patients that actively present.
- Standardised patients (sometimes called mystery clients), where trained individuals present as real care-seekers with predetermined case indications across a sample of providers. This method, despite its technical and ethical limitations, has become a leading method for measuring technical care quality in research studies and can assess safety and quality, patient-centredness, and equity of delivery with efficient sample sizes, while allowing researchers to assess the care given against national and international standards for the presented case.[89]

Determinants of low-quality care

As represented in figure 3, care that patients receive from a provider is determined by upstream, system-level policies and service variables.[81,115] The primary inputs are money and workforce and the ways that these inputs are organised and managed.

One reason for the severe deficits in care that medical vignettes reveal is poor medical knowledge. Our previous study in ten sub-Saharan African countries[10] used medical vignettes as a measure of clinical competence, finding that the median clinician correctly managed one-third of vignette conditions, whereas the top 25% of clinicians correctly managed at least half. In line with the standardised patient literature, this representative study identified the existence of a range of quality, with low-performance providers existing alongside, and often competing directly with, high-performance providers in all settings.

This study[10] found that although providers with the title of doctor (a category with a wide variety of meanings across the heterogeneous contexts considered here) had higher average competence than nurses or paraprofessionals, there was considerable overlap in performance, such that a substantial proportion of nurses had better performance scores than the median doctor. Educational attainment and seniority showed similar patterns, with considerable overlap in performance across categories. Although formal qualifications did not reliably describe the availability of quality care, this does not mean that we should be satisfied with poorly trained or unqualified staff. A number of systematic reviews and primary studies of pharmacy practice in LMIC settings in Asia[100,116] and in sub-Saharan Africa[117] show that outlets are often staffed by unqualified workers,[118] and that patients with serious symptoms are not referred appropriately.[119]

A second hypothesised reason for poor quality of care is poor morale and attitude, which can arise from weak incentives.[9] The know–do gap, whereby the performance of health-care providers in their clinical practice falls far below their knowledge frontier was shown in clinical settings in Tanzania and India, and has now been replicated in multiple countries.[120–122]

One particular example of a difference in incentives is between the public and private sector, with doctors in the public sector in LMICs typically paid a salary, while those in the private sector are typically paid on a fee-for-service basis. The question of care quality by private versus public provision has attracted considerable attention.[123] Interestingly, no clear advantage has emerged. Two systematic reviews did not find strong evidence for the superiority of either sector, and documented wide variation within each.[124,125] A study in Ethiopia, focusing on primary care, found that both types of clinic offer poor care, but that the types of quality deficits vary between private and public, with a tendency for private clinics to have better basic infrastructure and patient-centred care, while public clinics had greater availability of supplies and trained clinicians.[126] Studies often do not compare like with like; for instance, private care is often provided from smaller (often single-handed) clinics, whereas public facilities tend to be larger and have staff with more formal training.[127] In short, public and private care differ in their type of doctor, type of patient, and clinic-specific features. To correct for difference by doctor type and patient type, a study in the Indian state of Madhya Pradesh sent standardised patients to the public and private clinics of the same doctor and found that in their private clinics, the same doctors were more likely to correctly treat patients and adhere to a checklist of essential care.[128] To correct for patient type, a study in the Indian city of Mumbai, again using standardised patients, found higher consultation lengths and checklist completion in the private sector. Correct management rates were also higher in private settings, except with respect to public hospitals, where management practice was better in public hospital polyclinics,[42] a finding consistent with Aujla and colleagues,[129] who found very high-quality care in a teaching hospital polyclinic.

A third hypothesised reason for low quality of care is very high workloads. The relationship between usage rates (at both clinic and individual provider levels) and quality is of independent interest. One study found an inverted-U relationship consistent with worse provision when providers are underused or overwhelmed.[130] However, there is little evidence backing assertions of widespread overcrowding outside of hospital outpatient departments, and additional data from our study in ten sub-Saharan African countries showed little or no association between how busy a clinic was and the average performance of its staff.[10,19] Similarly, evidence suggests that increases in workload have little effect on quality of care,[131] although a point is reached where this is no longer true—for example, as shown by Liu and colleagues.[43]

Patterns in demand for care and provider choices: consumer perspectives

Understanding demand

We have seen that LMIC cities are replete with small-scale providers, that there are few physical barriers to care, that there is more than sufficient capacity (overall) to meet high usage, and that high-quality options are generally available, although the typical provider is of low quality. It would be a mistake to design programmes for improvement without understanding the preferences of those seeking care and the factors determining these preferences. Even if patient preferences are not aligned with their own best interests, programmes that do not account for such preferences might have very different consequences from what was envisioned. Therefore, we describe three kinds of studies: surveys of attributes that patients care about along with perceived barriers to care; preferences revealed by the actual choices made under existing constraints; and hypothetical choices made under hypothetical constraints (discrete choice experiments). In all these studies, people have been shown to have agency in their choice of provider, and the evidence indicates people make coherent decisions balancing costs and quality.

Surveys of barriers to access and care-seeker preferences

In 2022, a scoping review identified the main barriers to accessing primary care among the slum residents in LMICs.[132] A 2008 study from Karachi, Pakistan, not included in the review, made similar observations.[133] Not surprisingly, patients want low cost, minimal inconvenience and distance, respectful staff attitudes, and technical quality.[134] Discrimination has been shown to reduce vaccination uptake by migrant mothers in South Africa[135] and North Korean refugees in China.[136] Patients in LMICs tend to rate the quality of primary care lower than those in high-income countries,[137] and disrespectful care has been shown to be an important factor suppressing health seeking.[134] There is evidence from LMIC slums that recommendations from family and friends about trustworthy health-care providers influence health-care seeking decisions.[138] In this way, the supply and demand for health-care is linked—people will avoid providers with a poor reputation and, even in cities where there is an extensive choice, people might delay or avoid seeking care.

Whatever the barriers to care might be in the cities of LMICs, they do not seem to work equally across conditions (ie, demand might be less elastic when the condition is acute rather than chronic). We have cited evidence that, although people seek care for acute conditions, such as pain and fever, they seldom consult for chronic conditions and chronic but potentially serious symptoms.[25] Prescription data tell a similar story.[118] Similarly, costs are a significant barrier to uptake of vaccination, as shown in a 2022 study in Kampala, Uganda.[77] As described earlier, medicines comprise the major share of out-of-pocket expenses, particularly for people with chronic diseases such as high blood pressure and diabetes, where costs mount up over the years and where people might simply stop taking medicines due to cost.

Revealed preferences

There is consistent evidence from systematic reviews[139–141] that use of services declines as user fees are increased, and increases when user fees are reduced. Evidence specific to cities is less abundant than in rural areas, but the study across seven slums in four countries[25] found price elasticities to vary between 0 and –1 (the point at which a doubling in prices suppresses demand by 50%). The observation that prices do not vary more suggests that they are being held down by market forces.

The factors driving choice of provider (by category of patient) can be divided into three elements: cost to the patient, including travel and services charges (eg, consultations, drugs, and tests); inconvenience (covering travel time–distance, waiting in queues, and the compatibility of opening hours with the demands of work and essential routines); and perceived quality (eg, respectfulness and reputation). Given enough consultations and types of provider clinic, it is possible to model perceived quality given observed costs, inconvenience (using time or distance as a surrogate), and choice of provider type. Preferences can be revealed by observing the choice of providers in the catchment set of the patient, one example of which is bypassing behaviour whereby patients travel further to seek their preferred providers. Analysing individual bypassing behaviour in the light of costs and inconvenience, an attractiveness index was created in the seven slum study.[142] A facility is attractive in proportion to the extent that people bypass other facilities and incur greater health costs and inconvenience in doing so. As described above in the context of crowding and waiting times, hospital polyclinics are frequently visited by people who live in slums. Such visits bypass community clinics, and these observations result in a higher attractiveness index score for hospital polyclinics when compared with community clinics. However, even within slums, the Gini coefficient

is wide,[72] and the poorest of low-income people are less likely than those who are better off to trade perceived quality for cost and convenience—an important factor to note when designing services.

Discrete choice experiments

Discrete choice analysis deals with hypothetical choices but allows different provider type characteristics, and different amounts of these characteristics, to be traded off. There is a large body of literature using discrete choice experiments to understand preferences.[143–154] A consistent finding across these studies is that people place a premium on dimensions of quality, such as receiving a thorough physical examination, and availability of essential medicines. Quality is considered more important than cost and convenience,[147] in line with the revealed preferences above. Thus, while there are many reasons why people might bypass local clinics, including avoiding stigma if seen to visit a local clinic, the discrete choice experiments studies confirm the overriding importance of perceived quality.

From the aforementioned studies we can say that, even in slums, city dwellers have agency; they travel further and pay more for better services, at least as they perceive them.

Discussion

Decades of urban development and population shifting in LMICs have dramatically altered the primary care landscape to one where most people—including economically poor residents—have physical access to many primary care providers within short distances and travel times. This substantial access is accompanied by considerable variation in multiple aspects of health-care provision. Many clinics are small and independent, with low patient loads, but patients can also access outpatient departments of large hospitals where waiting times can be several hours. Similarly, pricing and service quality varies widely. Competition has not resulted in uniform high quality, since evidence overwhelmingly indicates that a sizeable fraction of primary care being delivered is low quality, notwithstanding the fact that LMICs are home to some of the most outstanding specialist hospitals in the world. What has emerged as common across these settings is a health-system structure that resembles typical private markets for services driven by the dynamics of competition and choice.

A key policy takeaway from these newly studied urban landscapes is that any attempt to improve the performance of these systems should consider the dynamics of patient choice and the interaction of all actors—public and private, suppliers, and consumers—in the market. Within these markets or systems, public services compete (explicitly or not) with private. Their subsidised status endows them with the potential to exert substantial influence over the behaviours of private providers, so long as they provide services that attract patients.

Within the private sector, providers face pressures to respond to market incentives and consumer preferences. The desire to attract patients can push improvements in quality, as evidenced with respect to the study of the same providers working in both private and public sectors.[128] The incentive to improve market share has also led to innovations in features, such as location and opening hours, that improve affordability and accessibility. However, economic theory holds that the information asymmetries that exist in health care lead to market failure.[155,156] We find evidence of this market failure in the form of excessive zeal to please, such that the patient is overtreated (eg, unnecessary antibiotic prescription), undertreated (eg, when the patient should be referred for an expensive investigation), or inappropriately treated (eg, using injectable over equally efficacious oral treatment when patients believe the former is stronger).[157] Consistent with economic theory, higher rates of unnecessary treatment have been observed in private practice versus public services.[128] But what is striking is the new evidence that has emerged from multiple settings showing that, even in the private sector, the most serious problem is not overtreatment but misdiagnosis. A 2023 study suggests that such misdiagnosis sometimes reflects not incompetence, but a conscious decision not to make an immediate referral for an expensive investigation that might prompt a distrustful patient to seek a second opinion from a competitor.[157] Understanding the primary care landscape as a complex system and the interaction of diverse actors, motivations, and constraints is crucial to developing policy to improve the availability of high-quality primary care.

In the second paper in this Series, we will consider implications for policy and show that the market of many providers we have described creates opportunities for policy makers to shape the market and exploit opportunities to implement policies at scale. As the global health community continues to expand the focus on primary care, and as ever-greater shares of the population come to reside in cities in LMICs, these new paradigms will only grow in importance and effect.

We close by repeating the caveats that our findings relate largely to large cities and lower-middle-income countries, rather than either low-income or upper-middle-income countries, and that unregistered people such as street children and migrant populations are under-represented in the literature on which we rely.

Contributors

All coauthors contributed to reviewing and editing drafts and approved the final submission. In addition, BD: writing the original draft, method, resources, data curation, formal analysis, and visualisation. BM: conceptualisation, writing the original draft, and method. CM: writing the original draft. EPP: conceptualisation and writing the original draft. EW: scoping review. GA: conceptualisation and literature search. JD: conceptualisation, formal analysis, method, supervision, and writing the original draft. JS: project administration. KatS: scoping review. KSh: conceptualisation. PJC: project administration and visualisation. RJL: conceptualisation, funding acquisition, investigation, method,

project administration, supervision, visualisation, and writing both the original draft and systematic review. SIW: conceptualisation and methodology. Y-FC: literature search for the review of systematic reviews and advised on the scoping review. ZAB: writing the original draft and methodology. BD, JD, KSc, RL, and SW directly accessed and verified the underlying data reported in this manuscript.

Declaration of interests

RJL, FG, JS, and SIW received funding from National Institute for Health and Care Research (NIHR) Research and Innovation for Global Health Transformation (NIHR: 200132) using UK Aid from the UK Government to support global health research. RJL, JS, and SIW received funding from the NIHR Global Health Research Unit on Improving Health in Slums. RJL, EPP, KSc, and CM received funding from the NIHR Global Health Research Unit on Social and Environmental Determinants of Health Unit. RJL, JS, and SIW received funding from NIHR Midlands Patient Safety Research Collaboration. RJL and PJC received funding from NIHR Applied Research Collaboration West Midlands. SIW also received funding from the Medical Research Council grant (MR/V038591/1). EPP received support from the Bill & Melinda Gates Foundation to attend symposiums and meetings. CM has a Research Productivity Grant from the National Council for Scientific and Technological Development of Brazil and a Distinguished Scientist Grant from Carlos Chagas Research Foundation–State of Rio de Janeiro. The views expressed in this publication are those of the authors and not necessarily those of the NIHR or the UK Department of Health and Social Care.

Acknowledgments

We thank Godwin Yeboah (University of Warwick), Grant Tregonning (University of Glasgow), and Joao Porto de Albuquerque (University of Glasgow) for their work on producing the maps showing health-care facilities in Ibadan and Dhaka (appendix p 62), as part of the NIHR Global Health Research Unit on Improving Health in Slums project.

References

1 The World Bank. Mortality rate, under-5 (per 1,000 live births). 2024. https://data.worldbank.org/indicator/SH.DYN.MORT?locations=KE (accessed May 25, 2024).

2 The World Bank. GDP per capita, PPP (current international $) - Kenya. 2024. https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?locations=KE (accessed May 25, 2024).

3 O'Neill A. Child mortality rate (under five years old) in the United Kingdom from 1800 to 2020. 2024. https://www.statista.com/statistics/1041714/united-kingdom-all-time-child-mortality-rate/ (accessed May 16, 2024).

4 Our World in Data. GDP per capita in England, 1924. 2024. https://ourworldindata.org/grapher/gdp-per-capita-in-the-uk-since-1270?time=1924.1960 (accessed May 25, 2024).

5 Vos T, Lim SS, Abbafati C, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020; **396:** 1204–22.

6 WHO, UNICEF. Operational framework for primary health care: transforming vision into action. 2020. https://www.who.int/publications/i/item/9789240017832 (accessed March 13, 2025).

7 WHO. Implementing the primary health care approach: a primer. 2024. https://www.who.int/publications/i/item/9789240090583 (accessed March 13, 2025).

8 United Nations Department of Economic and Social Affairs. 68% of the world population projected to live in urban areas by 2050, says UN. 2018. https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html. (accessed March 13, 2025).

9 Di Giorgio L, Evans DK, Lindelow M, et al. Analysis of clinical knowledge, absenteeism and availability of resources for maternal and child health: a cross-sectional quality of care study in 10 African countries. *BMJ Global Health* 2020; **5:** e003377-e.

10 Daniels B, Das J, Gatti R, Yi Chang A. Caseloads and competence in sub-Saharan Africa. Policy research working paper #11043. 2025. https://documents1.worldbank.org/curated/en/099836501232518461/pdf/IDU1673dede91ed4f1476618adf1c804e1275d38.pdf (accessed March 18, 2025).

11 Gatti RV, Andrews KG, Avitabile C, Conner RO, Sharma J, Yi Chang A. The quality of health and education systems across Africa: evidence from a decade of Service Delivery Indicators surveys. World Bank Group, 2021.

12 Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review--a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy* 2005; **10** (suppl 1)**:** 21–34.

13 Wong G, Greenhalgh T, Westhorp G, Buckingham J, Pawson R. RAMESES publication standards: realist syntheses. *BMC Med* 2013; **11:** 21.

14 Giles-Corti B, Moudon AV, Lowe M, et al. Creating healthy and sustainable cities: what gets measured, gets done. *Lancet Glob Health* 2022; **10:** e782–85.

15 WHO. Declaration of Alma-Ata. 1978. https://www.who.int/publications/i/item/WHO-EURO-1978-3938-43697-61471 (accessed March 13, 2025)

16 WHO. Declaration of Astana. 2018. https://www.who.int/publications/i/item/WHO-HIS-SDS-2018.61. (accessed March 13, 2025).

17 Starfield B. Is primary care essential? *Lancet* 1994; **344:** 1129–33.

18 Patwardhan B, Chaturvedi S, Chuthaputti A, Soon GC, Abeygunawardana D, Chol KS. What does the global south have to offer for global health and well-being? *Lancet Reg Health Southeast Asia* 2023; **17:** 100270.

19 Sheikh K, Josyula LK, Zhang X, Bigdeli M, Ahmed SM. Governing the mixed health workforce: learning from Asian experiences. *BMJ Glob Health* 2017; **2:** e000267.

20 Sudhinaraset M, Ingram M, Lofthouse HK, Montagu D. What is the role of informal healthcare providers in developing countries? A systematic review. *PLoS One* 2013; **8:** e54978.

21 Chaturvedi S, Porter J, Gopalakrishna Pillai GK, Abraham L, Shankar D, Patwardhan B. India and its pluralistic health system - a new philosophy for universal health coverage. *Lancet Reg Health Southeast Asia* 2023; **10:** 100136.

22 Shim J-M. Three plural medical systems in East Asia: interpenetrative pluralism in China, exclusionary pluralism in Korea and subjugatory pluralism in Japan. *Health Policy Plan* 2018; **33:** 401–10.

23 United States Agency for International Development. Health facility census in the Kampala Capital City Authority (KCCA) divisions. 2017. (accessed Aug 24, 2024).

24 Adams AM, Islam R, Ahmed T. Who serves the urban poor? A geospatial and descriptive analysis of health services in slum settlements in Dhaka, Bangladesh. *Health Policy Plan* 2015; **30** (suppl 1)**:** i32–45.

25 Watson SI, Bakibinga P, Kabaria C, ey al. Primary care doctor and nurse consultations among people who live in slums: a retrospective, cross-sectional survey in four countries. *BMJ Open* 2022; **12:** e054142-e.

26 Yeboah G, Porto de Albuquerque J, Troilo R, et al. Analysis of OpenStreetMap data quality at different stages of a participatory mapping process: evidence from slums in Africa and Asia. *ISPRS Int J Geoinf* 2021; **10:** 265.

27 Arinaminpathy N, Nandi A, Vijayan S, et al. Engaging with the private healthcare sector for the control of tuberculosis in India: cost and cost-effectiveness. *BMJ Glob Health* 2021; **6:** e006114.

28 Kwan A, Daniels B, Saria V, et al. Variations in the quality of tuberculosis care in urban India: a cross-sectional, standardized patient study in two cities. *PLoS Med* 2018; **15:** e1002653.

29 Carrasco-Escobar G, Manrique E, Tello-Lizarraga K, Miranda JJ. Travel time to health facilities as a marker of geographical accessibility across heterogeneous land coverage in Peru. *Front Public Health* 2020; **8:** 498.

30 Weiss DJ, Nelson A, Vargas-Ruiz CA, et al. Global maps of travel time to healthcare facilities. *Nat Med* 2020; **26:** 1835–38.

31 Das J, Hammer J. Location, location, location: residence, wealth, and the quality of medical care in Delhi, India. *Health Aff* 2007; **26** (suppl 2)**:** w338–51.

32 McNairy ML, Tymejczyk O, Rivera V, et al. High burden of non-communicable diseases among a young slum population in Haiti. *J Urban Health* 2019; **96:** 797–812.

33 Getachew S, Kaba M, Gizaw M, Taye G. Health service access, utilization and prevailing health problems in the urban vulnerable sections of Ethiopia. *Ethiop J Health Dev* 2020; **34**: 12–23.

34 Joulaei H, Bhuiyan AR, Sayadi M, Morady F, Afsar Kazerooni P. Slums' access to and coverage of primary health care services: a cross-sectional study in Shiraz, a metropolis in southern Iran. *Iran J Med Sci* 2014; **39** (suppl)**:** 184–90.

35 Das J, Hammer J, Sánchez-Paramo C. The impact of recall periods on reported morbidity and health seeking behavior. *J Dev Econ* 2012; **98:** 76–88.

36 Centers for Disease Control and Prevention. Ambulatory care use and physician office visits. 2023. https://www.cdc.gov/nchs/fastats/physician-visits.htm (accessed May 25, 2024).

37 Geldsetzer P, Manne-Goehler J, Marcus ME, et al. The state of hypertension care in 44 low-income and middle-income countries: a cross-sectional study of nationally representative individual-level data from 1·1 million adults. *Lancet* 2019; **394:** 652–62.

38 Omigbodun AO, Agboola AD, Fayehun OA, et al. Trends in clinical stage at presentation for four common adult cancers in Ibadan, Nigeria. *medRxiv* 2023; published online Sept 23 (preprint).

39 Tukey JW. Exploratory data analysis. Addison-Wesley, 1977.

40 Irving G, Neves AL, Dambha-Miller H, et al. International variations in primary care physician consultation time: a systematic review of 67 countries. *BMJ Open* 2017; **7:** e017902.

41 The World Bank. Quality and equity in basic health care services in Vietnam: findings from the 2015 Vietnam District and Commune Health Facility survey. 2016. https://microdata.worldbank.org/index.php/catalog/2728 (accessed March 13, 2025).

42 Daniels B, Shah D, Kwan AT, et al. Tuberculosis diagnosis and management in the public versus private sector: a standardised patients study in Mumbai, India. *BMJ Glob Health* 2022; **7:** e009657.

43 Liu C, Liu W, Wang Y, Zhang Z, Wang P. Patient safety culture in China: a case study in an outpatient setting in Beijing. *BMJ Qual Saf* 2014; **23:** 556–64.

44 Goodyear-Smith F, Bazemore A, Coffman M, et al. Primary care financing: a systematic assessment of research priorities in low- and middle-income countries. *BMJ Glob Health* 2019; **4** (suppl 8)**:** e001483.

45 McBride K, Moucheraud C. Rural-urban differences: using finer geographic classifications to reevaluate distance and choice of health services in Malawi. *Health Syst Reform* 2022; **8:** e2051229.

46 Akakba A, Lahmar B. Identification and analysis of spatial access disparities related to primary healthcare in Batna City, Algeria. *Geospat Health* 2023; **18**.

47 Chen L, Zeng H, Wu L, et al. Spatial accessibility evaluation and location optimization of primary healthcare in China: a case study of Shenzhen. *Geohealth* 2023; **7:** e2022GH000753.

48 Higgins J, Jerome JG, Boima F, et al. Community and facility-level barriers to achieving UHC in Kono District, Sierra Leone and Maryland County, Liberia. *PLOS Glob Public Health* 2023; **3:** e0002045.

49 Santos AFD, Rocha HAD, Lima ÂMLD, et al. Contribution of community health workers to primary health care performance in Brazil. *Rev Saude Publica* 2020; **54:** 143.

50 Wadge H, Bhatti Y, Carter A, Harris M, Parston G, Darzi A. Brazil's family health strategy: using community health care workers to provide primary care. The Commonwealth Fund, 2016.

51 Mash R, Goliath C, Mahomed H, Reid S, Hellenberg D, Perez G. A framework for implementation of community-orientated primary care in the Metro Health Services, Cape Town, South Africa. *Afr J Prim Health Care Fam Med* 2020; **12:** e1–5.

52 Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011; **377:** 1778–97.

53 Primary Health Care Performance Initiative. South Africa primary health care vital signs profile. 2022. https://www.improvingphc.org/sites/default/files/2022-12/SouthAfrica_VSP_2018.pdf (accessed Feb 6, 2024).

54 Schneider H, Besada D, Sanders D, Daviaud E, Rohde S. Ward-based primary health care outreach teams in South Africa: developments, challenges and future directions. *S Afr Health Rev* 2018; **1:** 59–65.

55 Li X, Krumholz HM, Yip W, et al. Quality of primary health care in China: challenges and recommendations. *Lancet* 2020; **395:** 1802–12.

56 Yang J, Siri JG, Remais JV, et al. The Tsinghua-Lancet Commission on Healthy Cities in China: unlocking the power of cities for a healthy China. *Lancet* 2018; **391:** 2140–84.

57 Edusei J, Amoah PA. Appreciating the complexities in accessing health care among urban poor: the case of street children in Kumasi metropolitan area, Ghana. *Developing Country Studies* 2014; **4:** 69–88.

58 Bwambale MF, Bukuluki P, Moyer CA, Van den Borne BHW. Utilisation of sexual and reproductive health services among street children and young adults in Kampala, Uganda: does migration matter? *BMC Health Serv Res* 2021; **21:** 169.

59 Awoh AB, Plugge E. Immunisation coverage in rural-urban migrant children in low and middle-income countries (LMICs): a systematic review and meta-analysis. *J Epidemiol Community Health* 2016; **70:** 305–11.

60 Nasiri N, Kostoulas P, Roshanfekr P, et al. Prevalence of HIV, hepatitis B virus, hepatitis C virus, drug use, and sexual behaviors among street children in Iran: a systematic review and meta-analysis. *Health Sci Rep* 2023; **6:** e1674.

61 Smartt C, Prince M, Frissa S, Eaton J, Fekadu A, Hanlon C. Homelessness and severe mental illness in low- and middle-income countries: scoping review. *BJPsych Open* 2019; **5:** e57.

62 Woan J, Lin J, Auerswald C. The health status of street children and youth in low- and middle-income countries: a systematic review of the literature. *J Adolesc Health* 2013; **53:** 314–21.

63 Carr-Hill R. Finding and then counting out-of-school children. *Compare* 2012; **42:** 187–212.

64 Chen W, Zhang Q, Renzaho AMN, Zhou F, Zhang H, Ling L. Social health insurance coverage and financial protection among rural-to-urban internal migrants in China: evidence from a nationally representative cross-sectional study. *BMJ Glob Health* 2017; **2:** e000477.

65 Hacker K, Anies M, Folb BL, Zallman L. Barriers to health care for undocumented immigrants: a literature review. *Risk Manag Healthc Policy* 2015; **8:** 175–83.

66 Asquith P, Neetzow R, von Freeden J, Schütze P. The link between documentation status, occupation status, and healthcare access for African migrants. *AHMR* 2021; **7**: 96–136.

67 South African National Department of Health. National Health Insurance Bill. 2023. https://www.health.gov.za/wp-content/uploads/2023/07/NHI-Bill-2023.pdf (accessed March 13, 2025).

68 Anstey Watkins J, Griffiths F, Goudge J. Community health workers' efforts to build health system trust in marginalised communities: a qualitative study from South Africa. *BMJ Open* 2021; **11:** e044065.

69 Larson E, George A, Morgan R, Poteat T. 10 Best resources on… intersectionality with an emphasis on low- and middle-income countries. *Health Policy Plan* 2016; **31:** 964–69.

70 de Siqueira Filha NT, Li J, Phillips-Howard PA, et al. The economics of healthcare access: a scoping review on the economic impact of healthcare access for vulnerable urban populations in low- and middle-income countries. *Int J Equity Health* 2022; **21:** 191.

71 WHO. Financial risk protection towards universal health coverage in the WHO African region. 2022. https://iris.who.int/handle/10665/361853 (accessed March 13, 2025).

72 Bakibinga P, Kabaria C, Kasiira Z, et al. Inequity of healthcare access and use and catastrophic health spending in slum communities: a retrospective, cross-sectional survey in four countries. *BMJ Glob Health* 2021; **6:** e007265.

73 Costa KS, Tavares NUL, Tierling VL, Leitão VBG, Stopa SR, Malta DC. National Health Survey 2019: medication obtainment through the Brazilian Popular Pharmacy Program by adults being treated for hypertension and diabetes. *Epidemiol Serv Saude* 2022; **31** (spe1)**:** e2021366.

74 Emmerick ICM, Campos MR, da Silva RM, et al. Hypertension and diabetes treatment affordability and government expenditures following changes in patient cost sharing in the "Farmácia popular" program in Brazil: an interrupted time series study. *BMC Public Health* 2020; **20:** 24.

75 Chow CK, Nguyen TN, Marschner S, et al. Availability and affordability of medicines and cardiovascular outcomes in 21 high-income, middle-income and low-income countries. *BMJ Glob Health* 2020; **5:** e002640.

76 Ocran Mattila P, Ahmad R, Hasan SS, Babar ZU. Availability, affordability, access, and pricing of anti-cancer medicines in low- and middle-income countries: a systematic review of literature. *Front Public Health* 2021; **9:** 628744.

77 Kamya C, Namugaya F, Opio C, et al. Coverage and drivers to reaching the last child with vaccination in urban settings: a mixed-methods study in Kampala, Uganda. *Global Health: Science and Practice* 2022; **10:** e2100663-e.

78 Osuh ME, Oke GA, Lilford RJ, et al. Oral health in an urban slum, Nigeria: residents' perceptions, practices and care-seeking experiences. *BMC Oral Health* 2023; **23:** 657.

79 Yousaf M, Aslam T, Saeed S, Sarfraz A, Sarfraz Z, Cherrez-Ojeda I. Individual, family, and socioeconomic contributors to dental caries in children from low- and middle-income countries. *Int J Environ Res Public Health* 2022; **19:** 7114.

80 Osuh ME, Oke GA, Lilford RJ, et al. Prevalence and determinants of oral health conditions and treatment needs among slum and non-slum urban residents: evidence from Nigeria. *PLOS Glob Public Health* 2022; **2:** e0000297.

81 Lilford RJ, Chilton PJ, Hemming K, Girling AJ, Taylor CA, Barach P. Evaluating policy and service interventions: framework to guide selection and interpretation of study end points. *BMJ* 2010; **341:** c4413-c.

82 Institute of Medicine Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. National Academies Press, 2001.

83 Bresick G, von Pressentin KB, Mash R. Evaluating the performance of South African primary care: a cross-sectional descriptive survey. *S Afr Fam Pract* 2019; **61:** 109–16.

84 Lilford R, Mohammed MA, Spiegelhalter D, Thomson R. Use and misuse of process and outcome data in managing performance of acute medical care: avoiding institutional stigma. *Lancet* 2004; **363:** 1147–54.

85 Zeng M, Cai Y, Cao J, et al. The agreement between virtual patient and unannounced standardized patient assessments in evaluating primary health care quality: multicenter, cross-sectional pilot study in 7 provinces of China. *J Med Internet Res* 2022; **24:** e40082.

86 Hermida J, Nicholas DD, Blumenfeld SN. Comparative validity of three methods for assessment of the quality of primary health care. *Int J Qual Health Care* 1999; **11:** 429–33.

87 Aujla N, Chen Y-F, Samarakoon Y, et al. Comparing the use of direct observation, standardized patients and exit interviews in low- and middle-income countries: a systematic review of methods of assessing quality of primary care. *Health Policy Plan* 2020; **36:** 341–56.

88 Das J, Hammer J. Which doctor? Combining vignettes and item response to measure clinical competence. *J Dev Econ* 2005; **78:** 348–83.

89 Daniels B, Boffa J, Kwan A, Moyo S. Deception and informed consent in studies with incognito simulated standardized patients: empirical experiences and a case study from South Africa. *Res Ethics* 2023; **19:** 341–59.

90 Sulis G, Adam P, Nafade V, et al. Antibiotic prescription practices in primary care in low- and middle-income countries: a systematic review and meta-analysis. *PLoS Med* 2020; **17:** e1003139.

91 Suthar JV, Patel VJ. Assessment of quality of prescribing in patients of hypertension at primary and secondary health care facilities using the Prescription Quality Index (PQI) tool. *Indian J Pharmacol* 2014; **46:** 480–84.

92 Boonstra E, Lindbaek M, Klouman E, Ngome E, Romøren M, Sundby J. Syndromic management of sexually transmitted diseases in Botswana's primary health care: quality of care aspects. *Trop Med Int Health* 2003; **8:** 604–14.

93 Silva LB, Silva PAB, Santos JFG, Silqueira SMF, Borges EL, Soares SM. Risk strata and quality of care for the elderly in primary health care. *Rev Lat Am Enfermagem* 2019; **27:** e3166.

94 Thandrayen K, Saloojee H. Quality of care offered to children attending primary health care clinics in Johannesburg. *SAJCH* 2010; **4:** 73–77.

95 Das J, Holla A, Das V, Mohanan M, Tabak D, Chan B. In urban and rural India, a standardized patient study showed low levels of provider training and huge quality gaps. *Health Aff* 2012; **31:** 2774–84.

96 Das J, Do Q-T. The prices in the crises: what we are learning from twenty years of health insurance in low- and middle-income countries. *J Econ Perspect* 2023; **37:** 123–52.

97 Sulis G, Daniels B, Kwan A, et al. Antibiotic overuse in the primary health care setting: a secondary data analysis of standardised patient studies from India, China and Kenya. *BMJ Global Health* 2020; **5:** e003393-e.

98 Edessa D, Assefa N, Dessie Y, Asefa F, Dinsa G, Oljira L. Non-prescribed antibiotic use for children at community levels in low- and middle-income countries: a systematic review and meta-analysis. *J Pharm Policy Pract* 2022; **15:** 57.

99 Sakeena MHF, Bennett AA, McLachlan AJ. Non-prescription sales of antimicrobial agents at community pharmacies in developing countries: a systematic review. *Int J Antimicrob Agents* 2018; **52:** 771–82.

100 Miller R, Goodman C. Performance of retail pharmacies in low- and middle-income Asian settings: a systematic review. *Health Policy Plan* 2016; **31:** 940–53.

101 Yin X, Song F, Gong Y, et al. A systematic review of antibiotic utilization in China. *J Antimicrob Chemother* 2013; **68:** 2445–52.

102 Ambaw Kassie G, Alemu A, Yosef Gebrekidan A, et al. Undiagnosed hypertension and associated factors among adults in Ethiopia: a systematic review and meta-analysis. *BMC Cardiovasc Disord* 2023; **23:** 278.

103 Pengpid S, Peltzer K. Prevalence and associated factors of undiagnosed hypertension among adults in the Central African Republic. *Sci Rep* 2022; **12:** 19007.

104 Ataklte F, Erqou S, Kaptoge S, Taye B, Echouffo-Tcheugui JB, Kengne AP. Burden of undiagnosed hypertension in sub-saharan Africa: a systematic review and meta-analysis. *Hypertension* 2015; **65:** 291–98.

105 Mauer N, Geldsetzer P, Manne-Goehler J, et al. Longitudinal evidence on treatment discontinuation, adherence, and loss of hypertension control in four middle-income countries. *Sci Transl Med* 2022; **14:** eabi9522.

106 Karagu A, Ng'ang'a A, Kibachio J, Gichangi P. Developing a national cancer control plan through effective partnerships: a case of Kenya National Cancer Control Strategy 2017–2022. *J Glob Oncol* 2018; **4** (suppl 2)**:** 160.

107 Teo AKJ, Singh SR, Prem K, Hsu LY, Yi S. Duration and determinants of delayed tuberculosis diagnosis and treatment in high-burden countries: a mixed-methods systematic review and meta-analysis. *Respir Res* 2021; **22:** 251.

108 Getnet F, Demissie M, Assefa N, Mengistie B, Worku A. Delay in diagnosis of pulmonary tuberculosis in low-and middle-income settings: systematic review and meta-analysis. *BMC Pulm Med* 2017; **17:** 202.

109 Bello S, Afolabi RF, Ajayi DT, et al. Empirical evidence of delays in diagnosis and treatment of pulmonary tuberculosis: systematic review and meta-regression analysis. *BMC Public Health* 2019; **19:** 820.

110 Kisuya J, Wachira J, Busakhala N, et al. Impact of an educational intervention on breast cancer knowledge in western Kenya. *Health Educ Res* 2015; **30:** 786–96.

111 Mutebi M, Wasike R, Mushtaq A, Kahie A, Ntoburi S. The effectiveness of an abbreviated training program for health workers in breast cancer awareness: innovative strategies for resource constrained environments. *Springerplus* 2013; **2:** 528.

112 Ngugi CW, Boga H, Muigai AWT, Wanzala P, Mbithi JN. Factors affecting uptake of cervical cancer early detection measures among women in Thika, Kenya. *Health Care Women Int* 2012; **33:** 595–613.

113 Brand NR, Qu LG, Chao A, Ilbawi AM. Delays and barriers to cancer care in low- and middle-income countries: a systematic review. *Oncologist* 2019; **24:** e1371–80.

114 Subedi R, Houssami N, Nickson C, et al. Factors influencing the time to diagnosis and treatment of breast cancer among women in low- and middle-income countries: a systematic review. *Breast* 2024; **75:** 103714.

115 Pope C, Robert G, Bate P, Le May A, Gabbay J. Lost in translation: a multi-level case study of the metamorphosis of meanings and action in public sector organizational innovation. *Public Adm* 2006; **84:** 59–79.

116 Kalita A, Bose B, Woskie L, Haakenstad A, Cooper JE, Yip W. Private pharmacies as healthcare providers in Odisha, India: analysis and implications for universal health coverage. *BMJ Glob Health* 2023; **8** (suppl 5)**:** e008903.

117 Wafula FN, Miriti EM, Goodman CA. Examining characteristics, knowledge and regulatory practices of specialized drug shops in sub-Saharan Africa: a systematic review of the literature. *BMC Health Serv Res* 2012; **12:** 223.

118 Watson S. Pharmacies in informal settlements: a retrospective, cross-sectional household and health facility survey in four countries. *BMC Health Serv Res* 2021; **21:** 945.

119 Clarke-Deelder E, Afriyie DO, Nseluke M, Masiye F, Fink G. Health care seeking in modern urban LMIC settings: evidence from Lusaka, Zambia. *BMC Public Health* 2022; **22:** 1205.

120 Leonard KL, Masatu MC, Vialou A. Getting doctors to do their best: the roles of ability and motivation in health care quality. *J Hum Resour* 2007; **42:** 682–700.

121 Das J, Hammer J. Money for nothing: the dire straits of medical practice in Delhi, India. *J Dev Econ* 2007; **83:** 1–36.

122 Das J, Hammer J, Leonard K. The quality of medical advice in low-income countries. *J Econ Perspect* 2008; **22:** 93–114.

123 Coarasa J, Das J, Gummerson E, Bitton A. A systematic tale of two differing reviews: evaluating the evidence on public and private sector quality of primary care in low and middle income countries. *Global Health* 2017; **13:** 24.

124 Basu S, Andrews J, Kishore S, Panjabi R, Stuckler D. Comparative performance of private and public healthcare systems in low- and middle-income countries: a systematic review. *PLoS Med* 2012; **9:** e1001244.

125 Berendes S, Heywood P, Oliver S, Garner P. Quality of private and public ambulatory health care in low and middle income countries: systematic review of comparative studies. *PLoS Medicine* 2011; **8:** e1000433-e.

126 Tessema GA, Mahmood MA, Gomersall JS, et al. Structural quality of services and use of family planning services in primary health care facilities in Ethiopia. How do public and private facilities compare? *Int J Environ Res Public Health* 2020; **17:** 4201.

127 Mackintosh M, Channon A, Karan A, Selvaraj S, Cavagnero E, Zhao H. What is the private sector? Understanding private provision in the health systems of low-income and middle-income countries. *Lancet* 2016; **388:** 596–605.

128 Das J, Holla A, Mohpal A, Muralidharan K. Quality and accountability in health care delivery: audit-study evidence from primary care in India. *Am Econ Rev* 2016; **106:** 3765–99.

129 Aujla N, Ilori T, Irabor A, et al. Development of a video-observation method for examining doctors' clinical and interpersonal skills in a hospital outpatient clinic in Ibadan, Oyo State, Nigeria. *BMC Health Serv Res* 2021; **21:** 488.

130 Arsenault C, Yakob B, Tilahun T, et al. Patient volume and quality of primary care in Ethiopia: findings from the routine health information system and the 2014 Service Provision Assessment survey. *BMC Health Serv Res* 2021; **21:** 485.

131 Kovacs R, Lagarde M. Does high workload reduce the quality of healthcare? Evidence from rural Senegal. *J Health Econ* 2022; **82:** 102600.

132 Park JE, Kibe P, Yeboah G, et al. Factors associated with accessing and utilisation of healthcare and provision of health services for residents of slums in low and middle-income countries: a scoping review of recent literature. *BMJ Open* 2022; **12:** e055415-e.

133 Memon ZA, Pach A, Rifkin M, et al. Health care preferences for children with typhoid fever in two slum communities in Karachi, Pakistan. *Southeast Asian J Trop Med Public Health* 2008; **39:** 1110–25.

134 Harris B, Eyles J, Penn-Kekana L, et al. Bringing justice to unacceptable health care services? Street-level reflections from urban South Africa. *Int J Transit Justice* 2013; **8:** 141–61.

135 Acheampong S, Lowane MP, Fernandes L. Experiences of migrant mothers attending vaccination services at primary healthcare facilities. *Health SA* 2023; **28:** 2166.

136 Chung HJ, Han SH, Kim H, Finkelstein JL. Childhood immunizations in China: disparities in health care access in children born to North Korean refugees. *BMC Int Health Hum Rights* 2016; **16:** 13.

137 Pinto DM, Tejerina L, Guanais FC, et al. From the patient's perspective: experiences with primary health care in Latin America and the Caribbean. Inter-American Development Bank, 2018.

138 Onuegbu C, Larweh M, Harlock J, Griffiths F. Systematic review of lay consultation in symptoms and illness experiences in informal urban settlements of low-income and middle-income countries. *BMJ Open* 2021; **11:** e050766.

139 Lagarde M, Palmer N. The impact of user fees on access to health services in low- and middle-income countries. *Cochrane Database Syst Rev* 2011; **2011:** CD009094.

140 Qin VM, Hone T, Millett C, et al. The impact of user charges on health outcomes in low-income and middle-income countries: a systematic review. *BMJ Glob Health* 2019; **3** (suppl 3)**:** e001087.

141 Dzakpasu S, Powell-Jackson T, Campbell OM. Impact of user fees on maternal health service utilization and related health outcomes: a systematic review. *Health Policy Plan* 2014; **29:** 137–50.

142 Conlan C, Cunningham T, Watson S, et al. Perceived quality of care and choice of healthcare provider in informal settlements. *PLOS Global Public Health* 2023; **3:** e0001281-e.

143 Bahrampour M, Bahrampour A, Amiresmaili M, Barouni M. Hospital service quality - patient preferences - a discrete choice experiment. *Int J Health Care Qual Assur* 2018; **31:** 676–83.

144 Berhane A, Enquselassie F. Patients' preferences for attributes related to health care services at hospitals in Amhara Region, northern Ethiopia: a discrete choice experiment. *Patient Prefer Adherence* 2015; **9:** 1293–301.

145 Černauskas V, Angeli F, Jaiswal AK, Pavlova M. Underlying determinants of health provider choice in urban slums: results from a discrete choice experiment in Ahmedabad, India. *BMC Health Serv Res* 2018; **18:** 473.

146 de Bekker-Grob EW, Donkers B, Jonker MF, Stolk EA. Sample size requirements for discrete-choice experiments in healthcare: a practical guide. *Patient* 2015; **8:** 373–84.

147 Fayehun O, Madan J, Oladejo A, et al. What influences slum residents' choices of healthcare providers for common illnesses? Findings of a discrete choice experiment in Ibadan, Nigeria. *PLOS Glob Public Health* 2023; **3:** e0001664-e.

148 Hanson K, McPake B, Nakamba P, Archard L. Preferences for hospital quality in Zambia: results from a discrete choice experiment. *Health Econ* 2005; **14:** 687–701.

149 Jiang MZ, Fu Q, Xiong JY, et al. Preferences heterogeneity of health care utilization of community residents in China: a stated preference discrete choice experiment. *BMC Health Serv Res* 2020; **20:** 430.

150 Kalyango E, Kananura RM, Kiracho EE. Household preferences and willingness to pay for health insurance in Kampala City: a discrete choice experiment. *Cost Eff Resour Alloc* 2021; **19:** 21.

151 Lungu EA, Guda Obse A, Darker C, Biesma R. What influences where they seek care? Caregivers' preferences for under-five child healthcare services in urban slums of Malawi: a discrete choice experiment. *PLoS One* 2018; **13:** e0189940-e.

152 Obadha M, Chuma J, Kazungu J, Abiiro GA, Beck MJ, Barasa E. Preferences of healthcare providers for capitation payment in Kenya: a discrete choice experiment. *Health Policy Plan* 2020; **35:** 842–54.

153 Vallejo-Torres L, Melnychuk M, Vindrola-Padros C, et al. Discrete-choice experiment to analyse preferences for centralizing specialist cancer surgery services. *Br J Surg* 2018; **105:** 587–96.

154 Zhang X. Application of discrete event simulation in health care: a systematic review. *BMC Health Serv Res* 2018; **18:** 687.

155 Propper C. Quasi-markets, contracts and quality in health and social care: the US experience. In: Le Grand J, Bartlett W, eds. Quasi-markets and social policy. Red Globe Press, 1993: 35–67.

156 Akerlof GA. The market for "lemons": quality uncertainty and the market mechanism. *Q J Econ* 1970; **84:** 488–500.

157 Banerjee A, Chowdhury A, Das J, Hammer J, Hussam R, Mohpal A. The market for healthcare in low income countries. Harvard Business School, 2023.