Improving WHO’s Understanding of WHO Guideline Uptake and Use in Member States: A Scoping Review

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Abstract

Background:
World Health Organization (WHO) publishes public health, clinical and data-use guidelines to guide member states to achieve better health outcomes. Furthermore, the WHO's Thirteenth General Programme of Work for 2019–2023 prioritizes strengthening its normative functional role and uptake of normative and standard-setting products, including guidelines at the country level. Therefore, understanding WHO guideline uptake by the member states, particularly the low and middle-income countries (LMICs), is of utmost importance for the organization and scholarship.

Methods:
We conducted a scoping review using systematic review methods. We used a comprehensive search strategy to include published literature in English between 2007 - 2020. Six databases - CINAHL, Cochrane Library, PubMed, Embase, SCOPUS, Google Scholar) and grey literature were searched. The review adhered to the PRISMA guidelines for reporting the searches, screening and identification of evaluation studies from the literature. A narrative synthesis of the evidence around key barriers and challenges for WHO guideline uptake in LMICs is thematically presented.

Results:
The scoping review included 48 studies, and the findings were categorised into four themes – 1) Lack of national legislation, regulations and policy coherence, 2) Inadequate experience, expertise and training of healthcare providers for guidelines uptake, 3) Funding limitations for guideline uptake and use, and 4) Inadequate healthcare infrastructure for guidelines compliance. These challenges were situated in the member states' health systems. The findings suggest governance was often weak within the existing health systems amongst most of the LIMCs studied, as was the guidance provided by WHO’s guidelines on governance requirements. This challenge was further exacerbated by a lack of accountability and transparency mechanisms for uptake of guidelines and implementation. In addition, the WHO guidelines themselves were either unclear or weak and were technically challenging for some health conditions; but primarily, WHO guidelines were used as a reference by member states when they developed their national guidelines.

Conclusions:
The challenges identified reflect the national health systems’ (in)ability to allocate, implement, and monitor the guidelines. Historically this is beyond the remit of WHO but member states could benefit from WHO implementation guidance on requirements and needs for successful uptake and use of WHO guidelines.

Contributions To The Literature

• Member states’ health systems determine the WHO guidelines uptake; weaker health systems continue to have low uptake and use of WHO guidelines.
• The challenges for WHO guideline uptake reflects the health systems ability to allocate, implement and monitor the guidelines. Historically this is beyond the remit of WHO but member states could benefit from
WHO implementation guidance on requirements and needs for successful deployment of NSPs.

- Robust feedback mechanisms between WHO and member states optimize WHO guideline uptake in member states and contribute to the guideline development process.

**Introduction**

World Health Organization (WHO) has a long tradition of supporting the Member States in developing national health policies, strategies and plans through country-level technical cooperation, facilitation of national policy dialogue and inter-country exchange, as well as through its normative work, including the provision of guidelines (1). WHO defines a guideline as any document developed by WHO containing recommendations for clinical practice or public health policy. These guidelines outline recommendations for “end-users” regarding what can or should be done in specific situations to achieve the best health outcomes possible. Guidelines are the fundamental means by which the organization fulfills its technical leadership role in health (2).

Low- and Middle-Income Countries (LMICs) often lack resources and/or skills to develop local guidelines and rely on guidelines developed by WHO and other international organizations (3). Constraints in guideline development in LMICs include methodological problems and inadequate resources (4). The COVID-pandemic also illustrated the woes of LMICs lack of access to big data analysis (5). Scholars have critically argued that LMICs in an attempt to adopt or emulate *clinical guidelines developed in rich countries, risks placing unnecessary strains on their health services* (6). WHO plays a critical role in addressing the need for evidence informed guidance for the member states, particularly LMICs. For example, WHO guidelines provided a valuable reference for establishing new national regulatory requirements or updating existing ones and promoting convergence at the global level to enable regulatory cooperation for biotherapeutics among the member states (7).

The WHO’s 13th General Programme of Work (GPW 13) also prioritizes strengthening its normative functional role and uptake of normative and standard-setting (NSPs) inclusive of guidelines at the country level (8). As such, the WHO policymakers and guideline developers seek to understand the extent of uptake and how the guidelines get integrated into the policy and practice in LMICs, where the maximum use of WHO guidelines is expected. However, the literature suggests limited evidence evaluating the barriers for uptake, use and impact of WHO guidelines (3, 9-11). WHO also echoes limited understanding of the uptake and use of NSPs by the member states, and aimed to understand the barriers to uptake and use and determinants of success of WHO’s NSPs at policy and practice levels in LMICs (12).

Since 2007, the WHO’s Guideline Review Committee (WHO-GRC) has engaged in defining the standards and methods for all guidelines that are funded, developed, issued by the WHO and follows rigorous methods of development to ensure its recommendations are evidence-based (13). To optimise uptake and use of WHO’s GRC approved guidelines, WHO commissioned a review of the literature to contribute to what is known about the uptake and use of WHO guidelines in LMICs. The review findings were intended to inform WHO about existing evidence around barriers for guideline uptake and support WHO’s Department of Quality Assurance, Norms and Standards activities (QNS), particularly strengthening the framework for monitoring, evaluation and learning on the uptake and use of WHO norms and standards in LMICs. Accordingly, we conducted a scoping
review to summarize evidence on the barriers to uptake of WHO's clinical and public health guidelines at policy and practice levels amongst LMICs, thereby contributing to the WHO's understanding of its guideline uptake.

**Methods**

Scoping reviews are highly valued evidence syntheses to inform decisions(14). A scoping review is defined as a type of research synthesis that aims to 'map the literature on a particular topic or research area and provide an opportunity to identify key concepts; gaps in the research; and types and sources of evidence to inform practice, policymaking, and research'(15). We conducted the scoping review between April and May 2021, to identify and synthesize the evidence around barriers to uptake of WHO-GRC approved guidelines in LMICs. Due to the heterogeneity of the study design for the included studies, a narrative synthesis was considered appropriate to present the findings of this scoping review.

**Search strategy**

The search strategy aimed to identify published articles that evaluated WHO guideline uptake in LMICs. We searched six electronic databases including CINAHL, the Cochrane Library, PubMed, EMBASE, SCOPUS and Google scholar. The search was limited to studies published between January 2007 (inception of WHO-GRC) and December 2020. We also reached out to the WHO departments and experts in implementation science to retrieve relevant published or gray literature.

**Study selection criteria**

Studies were included if they evaluated country-specific adaptation/ adoption/contextualisation, implementation, uptake/use of WHO-GRC approved clinical practice and public health guidelines within LMICs. Due to limited timeframe for this review, the selection of records was limited to studies reporting on guidelines for specific health conditions including nutrition, maternal and newborn child health, communicable diseases (TB, HIV, Malaria), non-communicable diseases, neglected tropical diseases (Filariasis and Schistosomiasis). These health conditions were selected in consultation with our advisory committee. There was no restriction on study design. We did however, exclude records that were not published in English language, were purely descriptive or opinion pieces as well as those that did not formally evaluate WHO guidelines or their components.

**WHO guideline and descriptor terms**

Scholars have noted that the titles of WHO guidelines often include a variety of descriptor terms other than ‘guidelines’ itself (16) rendering it difficult to identify WHO guidelines. A recent study on WHO guidelines reported considerable variation in descriptor terms used for the WHO document, including guideline(s), recommendation(s), guidance, policy statements, and a variety of other terms (manual, rapid advice, handbook, statement, guide, toolkit, technical paper).(16) In order to develop our screening criteria and to decide whether or not the descriptor reported in the articles qualify as a WHO guideline, we ascertained from the WHO-QNS team, a comprehensive list of GRC approved WHO guidelines recorded in WHO -IRIS database to identify all the terms used to define WHO guidelines. The data retrieved from the IRIS database included 439 WHO-GRC approved guidelines published between 2007 – 2020, 62% of these guidelines (n=273) were in English language. These
guidelines have used varied descriptor terms such as guidelines (n=151), recommendation/s (n=5), policy guidance (n=8), policy statement (n=6), guidance (n=5), others (n=98). Our review team screened and categorised these guidelines as per the pre-selected health conditions considered for this review (Table 1). The final list guided our screening criteria.

Eligibility assessment and Data extraction

All records identified through searches were uploaded to a proprietary review management software program (COVIDENCE©) and duplicate references were identified and subsequently removed. Four authors (KS, KSR, QW, YX) piloted the study selection process on a sample of records (n=20) based on the pre-defined inclusion/exclusion criteria, and inter-rater agreement was assessed. When agreement was sufficiently reached, the titles and abstracts for all the records were independently screened by two reviewers to identify eligible articles. Disagreements at this stage were resolved through discussion between the four reviewers. Full-text records were retrieved and reviewed for inclusion by a single author and verified by second author. Once inclusion was established, data were extracted for each study using a pre-piloted data extraction form. The review team followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines for reporting decisions for inclusion/exclusion and reporting of review items(17). Based on the narrative of the studies included in the review, the barriers to guideline uptake were categorised thematically.

Results

Forty-eight studies were identified as eligible for inclusion following full-text assessment (n = 48/7159) (Fig. 1). Two records were further identified as eligible for inclusion following reference list screening of the included records.

The detailed characteristics of the included studies and findings are presented in Table 2. The review findings elicit key barriers for uptake and use of WHO-GRC guidelines and are thematically categorised as 1) Lack of national legislation, regulations and policy coherence, 2) Inadequate experience, expertise and training of healthcare providers for guideline uptake, 3) Funding limitations for guideline uptake and use, and 4) Inadequate healthcare infrastructure for guideline compliance. For each thematic area, we present key examples of reported barriers to WHO-GRC guideline uptake.

1. Lack of national legislation, regulation, and policy coherence

Public health law refers to a statute, or rule or local ordinance that aims to promote or protect public health(18). Our findings suggest national public health legislations and regulations are pivotal to WHO guideline uptake and use in LMICs and a lack therein limits uptake. For example,

*in the context of communicable diseases*, Integrated Vector Management (IVM) is a vital component for controlling neglected tropical diseases and vector-borne diseases. In 2008, WHO issued a position statement supporting IVM consistent with the Global Strategic Framework for IVM. However, one of the key reasons cited for the slow uptake of the IVM was ‘*the lack of legislative activities’*(19).

*Non-communicable diseases (NCDs)*, in response to the escalating burden of NCDs worldwide, the World Health Assembly endorsed the WHO NCDs Global Action Plan 2013–2020 which provides several evidence-based
policy recommendations as ‘Best Buys’ for NCD prevention and control. 194 member states have adopted the NCD action plan, however most ‘Best Buy’ interventions are underutilised globally(20). For example, the implementation of the WHO policy recommendations remained low in LMICs of Africa due to ‘a lack of legislation and regulations for NCD control’(21). Scholars have noted that legislation and regulatory frameworks are pivotal to NCD prevention. The taxation on sugar-sweetened beverages with nutrition-sensitive agricultural policies can potentially improve overall health and nutrition in Africa and elsewhere. (22) However, lack of political will, legislation restrictions, and competing government priorities were identified as major barriers to policy coherence in Africa(22). Another recent review noted that although multi-sectoral collaboration and coordination were proposed at the policy level to tackle NCDs in India, but gaps remained in the implementation of such policies (23). Similarly, another review found ‘regulatory frameworks’ were essential for public health interventions targeting nutrition(24).

*Maternal and Newborn Child Health* , WHO recommends improving access to key maternal and newborn health interventions through task shifting’ guidelines(25). For the effective uptake and use of these recommendations, the legal protections and regulatory framework were found essential(26). WHO guidelines also recommend preventing early pregnancy and poor reproductive health outcomes among adolescents in LMICs. However, guideline uptake was constrained by lack of supporting laws and legislation along with other barriers in Ethiopia(27). Studies have reported that government policies prohibit the implementation of recommendations for post-partum haemorrhage (PPH) guidelines. For example, the administration of misoprostol by community healthcare workers was not supported by the policy in Uganda, despite studies conducted in Uganda demonstrated the safety and effectiveness of this approach under the supervision of midwives(28). Similarly, lack of legal frameworks for the uptake of Female Genital Mutilation (FGM) guidelines in most countries wherein FGM is practised (29).

2. **Inadequate experience, expertise, training and attitudes of healthcare providers**

Healthcare providers play an invaluable role in healthcare delivery. Hence, the capacity building of healthcare providers is essential in a health system. Advancement of knowledge and skills among practitioners’ is an important aspect of ‘capacity building’(30). WHO defines capacity building as “the development of knowledge, skills, commitment, structures, systems and leadership to enable effective health promotion...[with] actions to improve health at three levels: the advancement of knowledge and skills among practitioners; the expansion of support and infrastructure for health promotion in organizations, and; the development of cohesiveness and partnerships for health in communities”(31).

*Communicable diseases*, a comparative analysis of HIV testing and treatment services in six sub-Saharan African countries, argued WHO did not provide explicit guidance on HIV testing and treatment services (32). As a result, countries had to move beyond WHO standards to formulate national HIV treatment policies. The notable example includes policies related to pre-ART-CD4 monitoring intervals, rapid initiation of ART, task-shifting for ART initiation, drug resupply intervals, pill count recommendations, drug collection by designees, and referral to peer support home-based care. Despite concerted efforts to provide treatment consistent with WHO guidelines, lack of health information and data integration have constrained uptake and use of WHO’s Prevention of Mother to Child Transmission (PMTCT) HIV treatment guidelines in most LMICs. (33, 34). Similarly, the WHO and UNICEF recommend that HIV-positive women should avoid all breastfeeding only if replacement feeding is acceptable, feasible, affordable, sustainable and safe. However, the recommendations
were not implemented effectively within operational settings in South Africa due to the lack of standardized health messaging for mothers to adopt the best practices leading to inappropriate infant-feeding choices and consequent lower infant HIV-free survival(35).

*Maternal and Newborn Child Health,* in 2018, WHO called for global action towards the elimination of cervical cancer, with a key strategy among others, to screen 70% of women between the age of 35 and 45 years. A study suggests well-organised screening programs in high-income countries, but due to the lack of extensively experienced clinicians, LMICs did not achieve similar progress(36). In 2011, WHO recommended misoprostol use to manage and prevent PPH in settings where oxytocin is not available and included misoprostol in its essential medicines list (EML) model. However, fear and confusion among policymakers, programme managers and healthcare providers, lack of awareness about existing policy, lack of integration of misoprostol in basic health service package have been cited as the substantial barriers in successful implementation of misoprostol in developing countries (37). A review also highlighted that the research evidence does not support misoprostol use in home and community settings in LMICs for PPH prevention and indicated that the WHO should rethink its decision to include misoprostol on the EML(38).

Though the providers perceive PPH guidelines as useful, lack of guideline awareness, poor access to guidelines, prioritizing experience over evidence and incorrect clinical practice were key barriers to PPH guideline implementation in Kosovo(39). In another example, descriptions of the guidelines were superficial and there were discrepancies as to which ones were used in clinical practice, limited access to guidelines (insufficient copies) at healthcare facilities, adhering to midwifery school-based knowledge rather than guidelines as best practices, lack of knowledge about the rationale for using the guidelines (example use of oxytocin) were cited (40). In addition, lack of up-to-date guidance on recommended practices was also highlighted as a challenge, particularly around the use of misoprostol for prevention of the PPH in health facility settings in Uganda (28).

WHO recommended antenatal care (ANC) for a positive pregnancy experience for women, regardless of the income status of the countries. However, lack of access to external training programs as the key barrier for complying with ANC and PPH guidelines in LMICs (40-42). In 2009, WHO and UNICEF issued a joint statement recommending home visits by community-based agents as a strategy to improve newborn survival. The evaluation studies conducted in LMICs cited poor health workers’ attitudes as barriers to the strategy's uptake (43) and for optimal use of guidelines at the facility level (44).

### 3. Funding limitations for guideline uptake and implementation

Adequate funding is essential for fulfilling the "ten essential public health operations" enshrined in the WHO's essential public health services framework(45). However, LMICs continue to have limited public health funding and spending and rely on bilateral and multilateral assistance and other donor support. Our review suggests that the uptake and use of WHO guidelines in LMICs was significantly constrained by limited domestic public health funding and investments.

*Communicable diseases,* Indoor residual spraying (IRS) has been a proven and effective malaria vector intervention if correctly implemented using WHO recommended insecticides. The IRS programme implementation in Malaria endemic countries was often constrained due to funding limitations. For example,
IRS programme implementation in Malawi was found to be uncertain due to limited funding, cost of alternative insecticides and technical resource challenges being experienced in the country(46).

The 2013 WHO guidelines for antiretroviral therapy recommend expanding eligibility to include several new groups of people living with HIV, notably all HIV-infected adults with CD4þ T-cell counts between 350 and 500cells/ml, all pregnant women and serodiscordant couples regardless of CD4þ T-cell count, and all HIV-positive children up the age of 5 years. These guidelines were expected to double the number of people living with HIV/AIDS PLHIV’s on treatment, but several challenges limited its uptake in many countries (28, 44, 47). The most common barriers to the timely implementation of ‘new’ ART-initiation guidelines were economic constraints for the procurement of drugs(48).

In 2015, WHO provided guidelines recommended that any person at substantial HIV risk be offered oral pre-exposure prophylaxis (PrEP) containing tenofovir disoproxil fumarate (TDF), as an additional prevention choice. Further, in 2017, PrEP medicines were listed in the WHO’s EML, including TDF/emtricitabine (FTC) and TDF in combination with lamivudine (3TC). By the end of 2018, at least 40 countries (20.6%) were anticipated to have adopted WHO’s oral PrEP recommendation. However, policy uptake and programmatic coverage of PrEP services were constrained by the underlying cost of PrEP services in LMICs (49). Since 2015, WHO also recommended a commercially available lateral-flow urine LAM test (Alere-LAM) to assist in diagnosing TB in severely ill people living with HIV; however, the most commonly cited constraint to adoption and implementation of LAM was budget limitations (50).

Non-communicable diseases, WHO recommends virtually eliminating trans-fat from the global food supply. The LMICs such as India face several challenges requiring multisectoral food chain approach to remove trans fats from the food supply. Empirical evidence suggests economic incentives for manufacturing foods using healthier oils are imperative in India and elsewhere (51). In 2012, WHO had set the 25 × 25 Goal to achieve a 25% reduction in the number of premature deaths (occurring before 70 years of age) due to NCD by 2025. A Global Action Plan followed this with a target of 80% availability and affordability of essential medicines for treatment and secondary prevention of CVDs and other NCDs, and at least 50% of eligible people to receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes. A study reported the mean availability of essential medicines for CVD as 33%, much lower than the recommendation, and the available medicines were largely unaffordable, pointing towards the need for substantial investments in the LMICs(52).

Maternal and Newborn Child Health, in 2007, the Sixtieth WHA passed a resolution entitled “Better medicines for children”. Subsequently, the WHO recommended the inclusion of child-appropriate dosage formulations in the essential medicines lists of member countries. However, LMICs either have delayed or not included these recommendations in their national EML. The key barrier included the "lack of resources" that hindered the formal transfer of the policy from the global to the local level (53).

4. Inadequate healthcare infrastructure for guidelines compliance

Public health infrastructure provides the necessary foundation for undertaking the basic responsibilities of public health, which have been defined as the 10 Essential Public Health Services (45). Every public health program requires health professionals who are competent in cross-cutting and technical skills, up-to-date
information systems, and public health organizations with the capacity to assess and respond to community health needs. Public health infrastructure has been referred to as “the nerve center of the public health system” (54). However, in most LMICs, the public health infrastructure is inadequate for prevention and treatment programs.

*Communicable diseases*, the LMICs, especially sub-Saharan African countries had suboptimal uptake of WHO ART guidelines due to inadequate health systems in those countries. The barriers reported include no operational budget to support scale-up, difficulty transporting samples, delays in commodity procurement and distribution, inadequate laboratory information systems, insufficient trained human resources dedicated for viral load testing, equipment breakdown, delay in equipment repair, inadequate laboratory and storage space to accommodate sample volume, insufficient viral load testing results management (record keeping and use of results for patient management in health care facilities) (28, 55).

For Tuberculosis prevention, improved access to rapid diagnostics for TB drug resistance and second-line TB treatment, along with a strong evidence base to guide clinicians and policymakers(56). The 2018 WHO treatment guidelines for multidrug-/rifampicin-resistant tuberculosis (MDR/RR-TB), the capacity for drug susceptibility testing was reportedly insufficient in resource-limited settings requiring national tuberculosis programmes to strengthen their capacity to detect and manage MDR-TB consistent with the WHO guidelines (57). Similarly, another study reported lack of equipment, supplies and human resources were also identified as significant barriers to optimal malaria care in Tanzania and Kenya and the PMCTC of HIV in Malawi (58).

*Maternal and Newborn Child Health*, in the vast majority of countries, ANC is provided free of charge. Accessibility and availability of local transport (for example, visiting a clinic in a distant location or in an unfamiliar part of town), indirect costs associated with transport to and from the clinic in poor resource settings, the purchase of additional medicines were reported as barriers to ANC engagement in several LMICs. The lack of privacy in delivery of quality ANC, rigid and inflexible appointments, lack of medicine and medical equipment at clinics, poor explanation of tests, and lack of continuity of care also limits the delivery of quality ANC in LMICs(41, 59, 60). Studies also suggested the need for a minimum number of evidence-based quality indicators for quality of care in LMICs as opposed to an overwhelming number of indicators in the WHO guidelines (61, 62).

**Discussion**

Public health in LMICs is complex; implementing and taking up broad-sweeping guidelines is even more complex. Our findings reveal that guideline uptake in any one WHO member state is influenced by a multifactorial interplay of factors such as awareness of guidelines, funding, infrastructure, legislation and regulations etc. While most of the identified barriers can be attributed directly to challenges within the national health systems context, some barriers exist with the WHO guidelines.

1) **Stronger Health systems for Guideline Uptake**

Health systems are expected to fulfill three main functions - health care delivery, fair treatment to all, and meeting health expectations of the population, for which governance is vital. Health system governance is ‘an aggregation of normative values such as equity and transparency within the political system in which a health
system functions (63). It involves (1) setting strategic direction and objectives; (2) making policies, laws, rules, regulations, or decisions, and raising and deploying resources to accomplish the strategic goals and objectives; and (3) overseeing and making sure that the strategic goals and objectives are accomplished (64). However, the review findings suggest governance appears to be weak within the existing health systems in LMICs, as is the guidance provided by WHO guidelines on governance requirements. This includes weak or absent legislation or regulations, poor appreciation of procurement and stock out challenges, and weak follow-up at policy and practice levels. This is further exacerbated by a lack of accountability and transparency mechanisms for guideline uptake and implementation within the member states, particularly LMICs.

Health infrastructure challenges encompassing management and operations issues, systems and technical needs, to community resources were evident in guideline uptake for the health conditions selected in the study. For example, the review findings suggest lack of infrastructure is a critical barrier for guideline uptake and use in ANC in LMICs (58). These findings are consistent with the studies undertaken for mHealth interventions implementation in Africa (65). Studies suggest some of the infrastructural deficits in LMICs possibly improved by learning from and building on the successful response to HIV/AIDS through interactions between HICs and LMICs(3).

The resource constraints were evident in the evaluation studies undertaken in LMICs, particularly the clinical practice guidelines. For example, WHO ART guidelines uptake, most of the LMICs did not have a health system in place for guideline uptake and use, requiring domestic, bilateral, and multilateral funding to support guideline implementation. In addition, human resources capacity gaps such as poor-quality training, lack of opportunities for skill enhancement and lack of accountability for adherence to guidelines, lack of communication/interprofessional collaboration, ethnic/cultural differences were cited to be the limitation for WHO guideline uptake and use in health care settings(58). These challenges reflect the national health systems' ability to allocate, implement, and monitor the guidelines, which historically is beyond WHO's remit. Nevertheless, the evidence suggests financial incentives, and penalties encourage uptake of healthy behaviours(66, 67), compliance with clinical practice guidelines(68), and treatment guidelines(69). Therefore, the WHO guideline developers could potentially explore these opportunities as possible while developing the guidelines for better uptake.

Weak health systems hinder the implementation of effective intervention(70). Poor uptake of guidelines continues to be a significant challenge across health systems, particularly conflict-hit countries (71). Evidence suggests women living in regions with extremely high levels of conflict had decreased odds of meeting the WHO recommendations (72). For example, studies identified several challenges in Kosovo to uptake maternal health guidelines and contextualise them for local use. The 1998 – 1999 conflict substantially and adversely affected the healthcare infrastructure in Kosovo, which has resulted in an inability to monitor the quality of care across the country. Furthermore, the impact on infrastructure has affected the ability to access required medications consistently and smoothly transfer patients from rural to urban centres(73). This demonstrates stable and robust health systems as a critical determinant for guideline uptake in LMICs.

2) Reinvigorated WHO guidelines

Notwithstanding health systems challenges, the review findings suggest the WHO guidelines themselves were either unclear or weak and were technically challenging. Evidence from implementation research suggests that
detailed implementation plans are often necessary for local policymakers to use WHO guidelines. Studies have also found that the end-users’ adherence to and uptake of guidelines are negatively affected by guidelines without adequate implementation plans (10, 74, 75).

Further, implementation advice was often not provided, especially in terms of sustained capacity building and limited stakeholders engagement (76); and often, the too technical does not cater to the end-users needs. The review found these limitations, for example, PPH guidelines(28), Maternal and Newborn Care guidelines in Health Facilities(61), and consistent with the studies that reported WHO's confusing guidance on masks in the Covid-19 pandemic (77). Similar to many empirical research studies on a variety of health conditions in this review, the WHO evaluation office commissioned an evaluation of the impact of the WHO publications found also found "WHO products are often described as “too long, too technical” and need to be tailored to different audiences (78).

Our findings also suggest that WHO guidelines were being used as a reference by member states when developing their national guidelines. However, guideline dissemination and the monitoring and evaluation of guideline uptake were not well documented by WHO nor the member states for optimizing guideline uptake. A WHO commissioned an assessment of the contribution of WHO guidelines to improving RMNH in the South East Asia Region suggests that WHO engages its intended audience by deploying various dissemination means (e.g., electronic, regional meetings, etc.). However, the process was not well monitored or documented regarding the distribution of emails, downloads from websites and distribution of printed copies (79). Similarly, another review concluded the lack of well-documented adaptation methodologies in national HIV and/or TB guidelines and the need for a standardized and systematic framework for guideline adaptation and improved reporting of processes for guideline use(80). Further, the WHO guidelines often do not include feedback mechanisms for compliance between WHO and member states, significantly restricting the ability to learn, monitor, and evaluate the guideline uptake.

POLICY IMPLICATIONS

The WHO GPW13 focuses on triple billion targets to achieve measurable impacts on population health at the country level. The triple billion targets include one billion more people are benefiting from universal health coverage, one billion more people are better protected from health emergencies, and one billion more people are enjoying better health and well-being. WHO’s guidance is vital in achieving the triple billion targets and measurable impacts on population health for the member states. As the review findings determine the direct correlation between guideline uptake and health systems, the organisation, while producing evidence-based guidelines for better health outcomes in member states, should continue to encourage building stronger health systems to optimise the WHO guidelines in the member states. Additionally, WHO should Monitor and Evaluate the uptake of its guidelines with either existing or new ME tools, learning frameworks, and feedback loops between WHO and member states for optimising the WHO guideline uptake in member states. WHO SMART (Standards-based, Machine-readable, Adaptive, Requirements-based, and Testable) guideline are a comprehensive set of reusable digital health components is a way forward for optimizing guideline uptake (81).

LIMITATIONS
WHO maintains the Global Index Medicus (GIM) data, which provides worldwide access to biomedical and public health literature produced by and within LMICs. By not including GIM in our search strategy, the review may have missed some critical articles from the LMICs. Our screening criteria included the literature in English only, restricting the articles published in the English language.

Conclusions

The challenges for WHO guideline uptake reflects the health systems’ ability to allocate, implement and monitor the guidelines. Historically this is beyond the remit of WHO, but member states could benefit from WHO implementation guidance on requirements and needs for successful deployment of WHO’s normative standard-setting products, including the guidelines. Impact on health outcomes is derived primarily from guideline implementation; however, the extent that guidelines are implemented in countries, and the quality of that implementation, largely remains unknown. To a large extent, WHO guidelines are referenced and adapted at the country level into national policies, strategies, plans and clinical guidelines.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and material

Not applicable

Competing interests

The authors declare no competing interests.

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Authors' contributions

JH obtained funding for the study, KS and KSR designed it. KS and QW set up the database searches. KS, KSR, QW and YZ screened the literature search, acquired relevant articles and extracted data. YL, XC, RL, LH supported title screening, KS and KSR analysed and interpreted the data, wrote the first draft. QW, YZ, TH, FC, KB, JH reviewed and contributed to revisions. All authors approved the final version.

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Tables

Table 1 The list of health conditions for the 273 English guidelines
| Health condition/ Theme | N  | Health condition/ Theme | N  |
|------------------------|----|------------------------|----|
| Air Pollution          | 4  | Mental health          | 10 |
| Anthrax                | 1  | MNCH-A                 | 55 |
| Blood donation         | 4  | NCD                    | 8  |
| Chlamydia              | 1  | NCD/MNCH-A             | 1  |
| Dengue                 | 1  | NCD/SRH                | 1  |
| Disability             | 1  | Neisseria gonorrhoeae  | 1  |
| Drinking water         | 1  | Nutrition              | 14 |
| Drug                   | 4  | Nutrition/MNCH-A       | 7  |
| Drug/Substance use     | 1  | Nutrition/SRH          | 10 |
| Ebola                  | 2  | Rehabilitation         | 2  |
| Filariasis             | 1  | Rehabilitation/Health services | 1 |
| Gambiense human African trypanosomiasis | 1 | Respiratory | 1 |
| Health services        | 22 | Smoking                | 1  |
| Helminthiasis          | 2  | SRH                    | 14 |
| Hepatitis              | 8  | SRH/Health services    | 3  |
| Herpes Genitalis       | 1  | SRH/HIV                | 1  |
| HIV                    | 35 | SRH/MNCH-A             | 1  |
| Influenza              | 2  | Substance use          | 2  |
| Lung disease           | 1  | Syphilis               | 1  |
| Malaria                | 2  | TB                     | 38 |
| Measles                | 2  | Telemedicine            | 1  |
| Meningitis             | 1  | Zika                   | 2  |

Table 2: Studies on WHO guideline uptake and use included in the review
| Author                   | Year | Country                                      | Health condition                        | Guideline                                                                 | Barriers                                                                 |
|-------------------------|------|----------------------------------------------|------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Chanda et al.           | 2015 | Malawi                                       | Malaria                                  | WHO recommends Indoor Residual Spraying for malaria transmission control and elimination. | Limited funding, cost of alternative insecticides and technical resource challenges |
| Chinkonde et al.        | 2010 | Malawi                                       | HIV and Infant feeding                   | UNAIDS, WHO, UNFPA and UNICEF guidelines for HIV and infant feeding.       | Lack of consensus and general confusion regarding guidelines at all levels, need for resources, lack of up-to-date information, lack of contextualised and easy to follow guidelines |
| Church et al.           | 2015 | Kenya, Malawi, South Africa, Uganda, the United Republic of Tanzania and Zimbabwe | HIV                                      | HIV testing and treatment guidelines                                      | Lack of WHO's explicit guidance around pre-ART-CD4 monitoring intervals, rapid initiation of ART, task-shifting for ART initiation, drug resupply intervals, pill count recommendations, drug collection by designees, referral to peer support and home-based care |
| Doherty et al.          | 2007 | South Africa                                 | Infant feeding practices / HIV mothers   | WHO/UNICEF guidelines on infant feeding for HIV-positive women. The guidelines recommend that HIV-positive women should avoid all breastfeeding only if replacement feeding is acceptable, feasible, affordable, sustainable and safe. | Within operational settings, the WHO/UNICEF guidelines were not being implemented effectively, leading to inappropriate infant-feeding choices and consequent lower infant HIV-free survival. |
| Finocchiaro-Kessler et al. | 2016 | Kenya                                        | HIV                                      | Antiretroviral drugs for treating pregnant women and preventing HIV infection in | Inadequate and inconsistent training, less efficacious regimens, weak systems for patient |
| Author(s)          | Year | Region          | Disease | Intervention / Condition                                                                 | Challenges                                                                 |
|-------------------|------|-----------------|---------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Govere and Chimbari | 2020 | Sub-Saharan Africa | HIV     | Economic constraints, drug stock-outs, delays in obtaining baseline blood-test results and staff shortages. |
| Hodges-Mameletzis et al. | 2018 | LMICs           | HIV     | Pre-exposure prophylaxis (PrEP) containing tenofovir disoproxil fumarate (TDF)             |
| Jones-López et al.     | 2011 | Uganda          | TB      | Lack of access to rapid diagnostics for TB drug-resistance, second-line TB treatment, antiretroviral therapy and limited guidance among the policymaker and healthcare providers on using the tools available. |
| Lecher et al.        | 2015 | Sub-Saharan African Countries (Côte d'Ivoire, Kenya, Malawi, Namibia, South Africa, Tanzania, Uganda) | HIV     | Lack of trained laboratory personnel, no operational budget, difficulty transporting samples, delays in commodity procurement and distribution, inadequate laboratory information systems, insufficient trained human resources, equipment breakdown, delay in equipment repair, inadequate laboratory and storage space, insufficient viral load testing results management. |
| Nadjm et al.         | 2010 | Malaria         |         | In an area exposed to high transmission of malaria, current WHO guidelines failed to identify almost a third of children with severe infections or severe malnutrition. |
| Reference          | Year | Location                      | Disease | Guidelines | Outcomes |
|--------------------|------|-------------------------------|---------|------------|----------|
| Nasser et al.      | 2015 | 20 LMICs in Africa and Southeast Asia. | HIV and TB | WHO HIV and TB guidelines | Guidelines for care at first-referral level. This is the standard WHO guide for paediatric inpatient care and has been adopted as policy by the ministries of health of many resource poor countries. Invasive bacterial disease, and more than half of the organisms isolated were not susceptible to currently recommended antimicrobials. Improved diagnosis and treatment of invasive bacterial disease are needed to reduce childhood mortality. |
| Ngoma et al.       | 2015 | Zambia                        | HIV     | WHO guidelines | Maternal cART may limit MTCT of HIV to the UNAIDS target of ≤5% for eradication of paediatric HIV within the context of a clinical study, but poor adherence to cART and follow-up can limit the benefit. |
| Stanecki et al.    | 2010 | No country specific           | HIV     | WHO guidelines | Maternal cART may limit MTCT of HIV to the UNAIDS target of ≤5% for eradication of paediatric HIV within the context of a clinical study, but poor adherence to cART and follow-up can limit the benefit. |
| Stover et al.      | 2014 | 24 LMICs                      | HIV     | WHO ART treatment guidelines: | Mobilizing additional resources; expanding facilities, personnel, and drug supply chains; and identifying HIV-infected people at higher CD4+ T-cell counts and those in serodiscordant partnerships; the large number of patients |
| Tlhajoane et al.   | 2018 | Zimbabwe                      | HIV     | WHO recommendations on HIV testing services, prevention of mother-to-child transmission (PMTCT) of HIV, | Limited availability of different regimen choices provided challenges in the provision of ART stockouts; laboratory monitoring remained confined to larger hospitals. |
and provision of ART.

| Author(s)       | Year | Location | Disease | Source                                                                 | Comment                                                                 |
|-----------------|------|----------|---------|----------------------------------------------------------------------|------------------------------------------------------------------------|
| Tudor Car et al.| 2013 | LMICs    | HIV     | 1. WHO (2010) PMTCT strategic vision 2010–2015: preventing mother-to-child transmission of HIV to reach the UNGASS and Millennium Development Goals  
2. Technical Consultation on the Integration of HIV Interventions into Maternal, Newborn and Child Health Services  
3. WHO (2005) Glion consultation on strengthening the linkages between reproductive health and HIV/AIDS: family planning and HIV/AIDS in women and children | Late admission, unknown HIV status, fear of stigma, the policy context |
| Van Deun et al. | 2020 | LMICs    | TB      | WHO treatment guidelines for multidrug- and rifampicin-resistant tuberculosis. 2018 update | The drug susceptibility testing capacity, long regimen |
| Downs et al.    | 2015 | India    | NCDs    | WHO recommends virtually eliminating trans at from the global food supply. |                                                                       |
| Dzudie et al.   | 2020 | Cameroon | NCDs/ CVDs | WHO’s 25 × 25 Goal aims at achieving a 25% reduction in the number of premature deaths (occurring before 70 years of age) due to non-communicable disease (NCD) by 2025. | Non-availability of essential medicines for CVD was 33%, much lower than the 80% recommended by the WHO Global Action Plan for Prevention of NCD |
| Kaltenbrun et al. | 2020 | South Africa | NCDs and Nutrition | WHO recommends countries include a fiscal policy to reduce the consumption of sugar-sweetened beverages. | Political will, limited delivery capacity, legislation restrictions and competing government priorities |
|-------------------|------|--------------|--------------------|-------------------------------------------------|--------------------------------------------------|
| Pati et al.       | 2020 | India        | NCDs               | Global Monitoring Framework on NCD                | Challenges in the identification of eligible beneficiaries, shortage and poor capacity of frontline health workers, poor functioning of community groups and poor community knowledge on NCD risk factors were key gaps at the community level. Challenges at facility level such as poor facility infrastructure, lack of provider knowledge on standards of NCD care and below par quality of care led to poor management of NCDs. At the health system level, organization of care, programme management and monitoring systems were not geared up to address NCDs. Multi-sectoral collaboration and coordination were proposed at the policy level to tackle NCDs; however, gaps remained in implementation of such policies. |
| **Maternal, Newborn, and Child Health** | | | | | |
| Abebe et al.      | 2019 | Ethiopia     | MNCH/Neonatal      | Integrated Management of Childhood Illness (IMCI) strategy | Shortage of essential drugs and supplies, inadequate trained staff, time consuming nature of the protocol, lack of supervision, lack of knowledge about the strategy and lack of good attitude of healthcare workers/professionals towards the IMNCl strategy. |
| Authors          | Year | Location | Sector | Title                                                                 | Comments                                                                 |
|------------------|------|----------|--------|-----------------------------------------------------------------------|-------------------------------------------------------------------------|
| Ansah Manu et al. | 2014 | Ghana    | MNCH   | Home visits for the newborn child: a strategy to improve survival: WHO/UNICEF joint statement | Poor facility, poor health worker attitudes                              |
| Braddick et al.  | 2016 | Uganda   | MNCH   | WHO PPH-guideline: adherence to AMTSL guidelines according to WHO PPH recommendations | Healthcare system issues; current knowledge, awareness, and use of clinical guidelines; and healthcare practitioner attitudes to updating their clinical practice. |
| Chang et al.     | 2020 | Bangladesh | MNCH- | WHO's 2016 Standards for Improving Quality of Maternal and Newborn Care in Health Facilities | The volume of existing indicators                                        |
| Chu et al.       | 2012 | LMICs    | MNCH   | Misoprostol use to prevent and treat PPH                               | Research evidence does not support misoprostol use in home and community settings in low- and middle-income countries for PPH prevention. WHO should rethink its recent decision to include misoprostol on the Essential Medicines List. |
| Colvin et al.    | 2013 | Lower- and middle-income countries | MNCH | WHO Recommends Optimizing Health Worker Roles to Improve Access to Key Maternal and Newborn Health Interventions through Task Shifting’ guidelines | Lack of legal protection and liabilities and the regulatory framework for task shifting |
| Doku and Neupane | 2017 | 57 LMICs | MNCH - ANC | WHO recommendations for ANC (first visit within the first trimester and at least four visits during pregnancy) | |
| Author et al. | Year | Country/Region | Sector | Key Findings |
|--------------|------|---------------|--------|--------------|
| Downe et al. | 2019 | South Africa, Indonesia, UK, Papua New Guinea, Australia, Peru, Uganda, Ghana, USA, Brazil, Ethiopia, Mozambique, Nigeria, Bangladesh, Argentina, Kenya, Iran, Vietnam, India, Tanzania, Canada, Republic of Ireland, Lebanon, Pakistan, Australia, New Zealand, Sweden, Colombia, Romania, Laos, Zimbabwe, Cambodia, Peru, Georgia, South Sudan, Afghanistan, Iraq, Nepal, Gambia, Swaziland, France, Burkina Faso | MNCH | WHO recommendations on antenatal care for a positive pregnancy experience |
| Khosla et al. | 2017 | Global | MNCH | WHO developed the 2016 Guidelines on the Management of Health Complications from FGM |
| Kraft et al. | 2018 | Ethiopia and Senegal | MNCH/Family planning | WHO’s evidence-based FP guidance and tools (i.e., materials) that support the provision of quality FP services. |
| Kumar et al. | 2016 | India | MNCH | The WHO Safe Childbirth Checklist (SCC): The SCC targets high impact best practices around 4 pause points that occur in almost every delivery: |

Inconvenience of clinic attendance, lack of accessibility and availability of local transport, indirect costs, potential loss of income, lack of privacy, lack of medicine and equipment, medical jargon

Lack of national legislation

Resource constraints

High-quality care provision at institutions is still a challenge
| Reference | Year | Country | Program | Findings |
|-----------|------|---------|---------|----------|
| Mchenga et al. | 2019 | Malawi | MNCH | 2001 Focused Antenatal Care (FANC) programme |
| Nsabagasani et al. | 2015 | Uganda | MNCH | WHO recommends the inclusion of child-appropriate dosage formulations in the essential medicines lists of member countries |
| Ritchie et al. | 2016 | LMICs | MNCH | WHO guidelines on maternal, reproductive and women's health |
| Roberts et al. | 2017 | Malawi | MNCH-A | 2011 WHO statement on antenatal care |
| Samnani et al. | 2017 | developing countries | MNCH | Inclusion of included misoprostol in its essential medicines list (EML) model in March 2011. |
and fear and apprehensions related to its use at provider and policy level. Leadership, governance and policy related issues are substantial barriers in successful implementation of misoprostol in developing countries; fear and confusion among implementers, policy makers and government officials; lack of awareness about existing policy; lack of integration of misoprostol in basic health service package

| Shilton et al. | 2019 | Ethiopia | MNCH | WHO guidelines on preventing early pregnancy and poor reproductive health outcomes among adolescents in developing countries | Knowledge, national agenda, laws, resources, culture, cooperation |
|---------------|------|----------|------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Straus et al. | 2013 | Kosovo  | MNCH | WHO postpartum hemorrhage guidelines | Lack of communication between clinicians and ministry representatives, substantial mistrust between clinicians and policy makers, lack of communication across clinical groups that provide obstetric care and a lack of integration across the entire healthcare system, including rural and urban centres, inability to monitor quality of care, inability to access required medications consistently and to smoothly transfer patients from rural to urban centres |
| Vogel et al.  | 2016 | 4 LMICs - Myanmar, | MNCH | WHO Maternal and Perinatal | Health system level factors, including |
| Author(s)               | Year | Country/Region        | Topic/Service Area       | Summary                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|------|-----------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Xue et al.             | 2020 | LMICs, MNCH, Cervical | WHO calls for global action towards the elimination of cervical cancer; one of the main strategies is to screen 70% of women between the age of 35 and 45 years and 90% of women managed appropriately by 2030, in order to achieve less than four new cases per 100,000 women | Shortage of experienced colposcopists, consummate colposcopy training courses, and uniform diagnostic standard and strict quality control                                                                                                                                         |
| Zhang et al.           | 2017 | 74 Countdown countries, MNCH | 1. Guidelines for the management of common illnesses with limited resources 2. Community health worker manual, Facilitator notes 3. Guidelines for the management of common childhood illnesses. 2nd edition |                                                                                                                                                                                                                                                                                                                                                                     |
| Ziegler et al.         | 2020 | Democratic Republic of the Congo, MNCH | WHO recommendations on antenatal care for a positive care | Conflicts                                                                                                                                                                                                                                                                                                                                                         |
|          | Year | Region                  | Topic                          | Description                                                                 |
|----------|------|-------------------------|-------------------------------|-----------------------------------------------------------------------------|
| Hossain et al. | 2017 | LMICs                   | Nutrition - severe acute malnutrition (SAM) in children | WHO’s facility-based guideline for the reduction of under-five SAM children mortality | High rates of poverty, malnutrition, severe co-morbid condition, lack of resources and differences in treatment practices |
| Mejia et al.  | 2019 | The Americas: Chile, Costa Rica, and Guatemala; Africa: Malawi, Uganda, and Zambia; South Asia: Bangladesh; and the Western Pacific Region: China and the Philippines. | Nutrition | WHO recommends public health interventions to provide vitamins and minerals. | Lack of regulatory frameworks, lack of safety measures |

**Figures**

![Flowchart of the review process](chart.png)
Figure 1

Scoping Review Study Flow Diagram