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35. Meta-Analysis Lancet Psychiatry 2020 Oct;7(10):851-864. doi: 10.1016/S2215-0366(20)30256-X. Epub 2020 Aug 28.

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43. TMIH 2020;25(11):1308-27

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44. TMIH 2020; Dec 1. doi: 10.1111/tmi.13533. Online ahead of print.

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45. Am J Trop Med Hyg 2020 Nov;103(5):1827-1833.
Lung Ultrasound Findings Compared with Chest X-Ray Findings in Known Pulmonary Tuberculosis Patients: A Cross-Sectional Study in Lima, Peru

46. Am J Trop Med Hyg. 2020 Dec 2. Online ahead of print.
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48. Am J Trop Med Hyg. 2020 Nov 23. Online ahead of print.
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International Health Alerts 2020-4 Abstracts

Child Health

1. Lancet 2020; 396(10253):786-98

Review
Complicated pneumonia in children
De Benedictis FM et al., Salesi Children's Hospital Foundation, Ancona, Italy <a.bush@imperial.ac.uk>
Complicated community-acquired pneumonia in a previously well child is a severe illness characterised by combinations of local complications (eg, parapneumonic effusion, empyema, necrotising pneumonia, and lung abscess) and systemic complications (eg, bacteraemia, metastatic infection, multiorgan failure, acute respiratory distress syndrome, disseminated intravascular coagulation, and, rarely, death). Complicated community-acquired pneumonia should be suspected in any child with pneumonia not responding to appropriate antibiotic treatment within 48-72 h. Common causative organisms are Streptococcus pneumoniae and Staphylococcus aureus. Patients have initial imaging with chest radiography and ultrasound, which can also be used to assess the lung parenchyma, to identify pleural fluid; CT scanning is not usually indicated. Complicated pneumonia is treated with a prolonged course of intravenous antibiotics, and then oral antibiotics. The initial choice of antibiotic is guided by local microbiological knowledge and by subsequent positive cultures and molecular testing, including on pleural fluid if a drainage procedure is done. Information from pleural space imaging and drainage should guide the decision on whether to administer intrapleural fibrinolytics. Most patients are treated by drainage and more extensive surgery is rarely needed; in any event, in low-income and middle-income countries, resources for extensive surgeries are scarce. The clinical course of complicated community-acquired pneumonia can be prolonged, especially when patients have necrotising pneumonia, but complete recovery is the usual outcome.

2. N Engl J Med 2020; 383 (No 13):1231-1241

Lower-Dose Zinc for Childhood Diarrhea — A Randomized, Multicenter Trial
Usha Dhingra, et al. Address reprint requests to Dr. Simon at the Department of Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, or at jonleesimon@gmail.com
BACKGROUND
The World Health Organization recommends 20 mg of zinc per day for 10 to 14 days for children with acute diarrhea; in previous trials, this dosage decreased diarrhea but increased vomiting.
METHODS
We randomly assigned 4500 children in India and Tanzania who were 6 to 59 months of age and had acute diarrhea to receive 5 mg, 10 mg, or 20 mg of zinc sulfate for 14 days. The three primary outcomes were a diarrhea duration of more than 5 days and the number of stools (assessed in a noninferiority analysis) and the occurrence of vomiting (assessed in a superiority analysis) within 30 minutes after zinc administration.
RESULTS

The percentage of children with diarrhea for more than 5 days was 6.5% in the 20-mg group, 7.7% in the 10-mg group, and 7.2% in the 5-mg group. The difference between the 20-mg and 10-mg groups was 1.2 percentage points (upper boundary of the 98.75% confidence interval [CI], 3.3), and that between the 20-mg and 5-mg groups was 0.7 percentage points (upper boundary of the 98.75% CI, 2.8), both of which were below the noninferiority margin of 4 percentage points. The mean number of diarrheal stools was 10.7 in the 20-mg group, 10.9 in the 10-mg group, and 10.8 in 5-mg group. The difference between the 20-mg and 10-mg groups was 0.3 stools (upper boundary of the 98.75% CI, 1.0), and that between the 20-mg and 5-mg groups was 0.1 stools (upper boundary of the 98.75% CI, 0.8), both of which were below the noninferiority margin (2 stools). Vomiting within 30 minutes after administration occurred in 19.3%, 15.6%, and 13.7% of the patients in the 20-mg, 10-mg, and 5-mg groups, respectively; the risk was significantly lower in the 10-mg group than in the 20-mg group (relative risk, 0.81; 97.5% CI, 0.67 to 0.96) and in the 5-mg group than in the 20-mg group (relative risk, 0.71; 97.5% CI, 0.59 to 0.86). Lower doses were also associated with less vomiting beyond 30 minutes after administration.

CONCLUSIONS

Lower doses of zinc had noninferior efficacy for the treatment of diarrhea in children and were associated with less vomiting than the standard 20-mg dose.

3. PLoS Med 17(10): e1003449. (2020)

Revisiting child and adolescent health in the context of the Sustainable Development Goals. Bhutta ZA, Yount KM, Bassat Q, Arikainen AA. Centre for Global Child, The Hospital for Sick Children, Toronto, Canada, Institute for Global Health & Development, The Aga Khan University South-Central Asia, East Africa & London, United Kingdom. Mail: zulfiqar.bhutta@sickkids.ca.

Attention to children during the pandemic has concentrated on school closures, food insecurity, and access to care within health systems taxed by COVID-19 mitigation and response efforts. The situation of child and adolescent health before COVID-19, and consequences of the pandemic on specific health targets for SDG 3, therefore deserve attention.

As the Millennium Development Goals (MDGs) ended in 2015, activities and plans addressed the global compacts for reducing child mortality. A focus was on determinants, such as maternal and child undernutrition, gender inequities, and intersecting vulnerabilities. Because adolescents were largely ignored in the MDG process, advocacy and effort were invested to make them central to the SDG agenda. The renewed global strategy for Every Woman Every Child, launched by the UN Secretary General in 2013, was a segue to the SDGs and an effort to go beyond survival toward a transformative agenda that included healthy development. Advocacy for the integration of health, nutrition, and early child development led to the development of the nurturing care framework.

As we examine the situation more than 5 years into the SDGs, several concerns emerge. Despite progress, the field remains fragmented, with limited actions in countries to develop integrated strategies for reproductive, maternal, newborn and child health (RMNCH), or inclusion of adolescent health within national plans. Work on the drivers of adolescent health, well being, and empowerment is underway but has yet to translate into a reasonable global strategy. This lag stems from complex, multilevel social influences during adolescence, insufficient disaggregation of data on adolescents, suboptimal measurement and a lack of well-defined indicators, and limited evidence on the differential impacts of social policies and programs within adolescence and between adolescence and adulthood. Within health systems, many nutrition programs remain poorly integrated with other RMNCH programs and few have substantive links with sectors outside health. With the unfinished agenda for maternal, newborn and child deaths, rigorous studies to address mechanisms and hitherto unrecognized causes of excess mortality are just beginning to yield results, albeit with older pediatric age groups remaining significantly understudied, even at the simplest descriptive level. Effort is limited to bring mental-health programming to women and children, especially in conflict settings or emergencies such as the COVID-19 pandemic. These silos in research, planning and policy, and service delivery apply equally to other sectors, and to multi-sectoral planning and implementation at country level. To address the SDGs, we must consider life in the 21st century—including the disruptions of technological change, economic shocks, climate change, and conflict and security.

The SDGs have a broader agenda, translated into “survive-thrive-transform” in the Global Strategy for Women’s, Children’s and Adolescents’ Health 2016–2030, with major targets and indicators in the

health sector and beyond. We remain concerned that the gains in early child health painstakingly achieved in the MDG period are at risk of slowing down and losing priority. The global challenges of improving survival and health from birth through adolescence remain, and the world needs to redouble its efforts to do better, rather than declare victory prematurely and move on.
In a forthcoming PLOS Medicine special issue, we are inviting impactful research in this important area on strategies to monitor and combat child mortality globally from birth through adolescence, school-age health and welfare, marginalised populations, and the environmental impacts on children's health. We hope that this special issue will help to redirect attention to child and adolescent health in years to come.

Communicable and infectious Diseases

4. TMIH 2020;25(12):1432-40

Review
Challenges in the last mile of the global guinea worm eradication program
Lemma GW et al., Heidelberg Institute of Global Health, Ruprecht-Karls Universität Heidelberg, Heidelberg, Germany
Objective: The objective of this study was to identify the existing challenges in the last mile of the global Guinea Worm Eradication Program.
Methods: Systematic Review of articles published from 1 January 2000 until 31 December 2019. Papers listed in Cochrane Library, Google Scholar, ProQuest PubMed and Web of Science databases were searched and reviewed.
Results: Twenty-five articles met inclusion criteria of the study and were selected for analysis. Hence, relevant data were extracted, grouped and descriptively analysed. Results revealed 10 main challenges complicating the last mile of global guinea worm eradication: unusual mode of transmission; rising animal guinea worm infection; suboptimal surveillance; insecurity; inaccessibility; inadequate safe water points; migration; poor case containment measures, ecological changes; and new geographic foci of the disease.
Conclusion: This systematic review shows that most of the current challenges in guinea worm eradication have been present since the start of the campaign. However, the recent change in epidemiological patterns and nature of dracunculiasis in the last remaining endemic countries illustrates a new twist. Considering the complex nature of the current challenges, there seems to be a need for a more coordinated and multidisciplinary approach of dracunculiasis prevention and control measures. These new strategies would help to make history by eradicating dracunculiasis as the first ever parasitic disease.

5. Am J Trop Med Hyg 2020 Nov;103(5):1797-1802

Usefulness of C-Reactive Protein and Other Host BioMarker Point-of-Care Tests in the Assessment of Non-Malarial Acute Febrile Illnesses: A Systematic Review with Meta-Analysis
Giulia Bertoli et al, Department of Infectious, Tropical Diseases and Microbiology, IRCCS Sacro Cuore Don Calabria Hospital, Verona, Italy.
In low- and middle-income countries, in resource-limited settings, the implementation of diagnostic tools discriminating bacterial from nonbacterial fever is a matter of primary concern. The introduction of malaria rapid diagnostic tests highlighted the need for point-of-care tests (POCTs) supporting clinical decision-making for non-malarial febrile illnesses. The purpose of this work was to review the use of host biomarker POCTs for the assessment of acute non-malarial fever in resource-constraint settings. Specific objectives were as follows: 1) to estimate the accuracy of such tests in differentiating fever of bacterial from nonbacterial origin and 2) to assess the impact of host biomarkers on antibiotic prescription and clinical outcome. We conducted a systematic review searching PubMed, Embase, the Cochrane Library, and Bireme. The protocol was registered with PROSPERO (n CRD42019141735). Data on the accuracy of C-reactive protein (CRP) for the detection of bacterial infections were meta-analyzed using the hierarchical summary receiver operating characteristic model, obtaining a summary ROC (SROC). We identified 2,192 articles, eight of which were included in the review. Among the different biomarkers evaluated, CRP was the one most frequently studied. The SROC presented an

area under the curve = 0.77 (CI: 0.73-0.81), which indicates good accuracy to distinguish bacterial from nonbacterial infections. However, the optimal cutoff of CRP could not be assessed, and we found insufficient evidence about its impact on antibiotic prescription and clinical outcome. The role of CRP and other host biomarker POCTs for the assessment of acute non-malarial febrile illnesses in resource-constraint settings deserves further studies.

6. Am J Trop Med Hyg 2020 Nov;103(5):1969-1977.

Village Response to Mass Drug Administration for Schistosomiasis in Mwanza Region, Northwestern Tanzania: Are We Missing Socioeconomic, Cultural, and Political Dimensions?

Joseph R Mwanga et al, Department of Epidemiology, Biostatistics and Behavioral Sciences, School of Public Health, Catholic University of Health and Allied Sciences, Mwanza, Tanzania.

Praziquantel (PZQ)-based mass drug administration (MDA) is the main approach for controlling schistosomiasis in endemic areas. Interventions such as provision and use of clean and safe water, minimizing contacts with infested water, disposal of human waste in latrines, and snail control provide additional key interventions to break the transmission cycle and could complement and perhaps sustain the benefits of MDA. However, all interventions deployed need to be accepted by the targeted communities. A qualitative study was conducted to examine factors that might differentiate villages which did not show a substantial decrease in Schistosoma mansoni prevalence despite repeated, high treatment coverage referred to as "persistent hotspot (PHS) villages" from villages which showed a substantial decrease in prevalence referred to as "responding (RES) villages." A convenient sample of adults was drawn from eight villages. Thirty-nine key informants were interviewed and 16 focus groups were held with a total of 123 participants. Data were analyzed manually using a thematic content approach. In both PHS and RES villages, schistosomiasis was not considered to be a priority health problem because of its chronic nature, lack of knowledge and awareness, and poverty among study communities. Persistent hotspot villages exhibited poor leadership style, lack of or insufficient social engagement, little or lack of genuine community participation, little motivation, and commitment to schistosomiasis control compared with RES villages where there were commitment and motivation to fight schistosomiasis. We support the view of scholars who advocate for the adoption of a biosocial approach for effective and sustainable PZQ-based MDA for schistosomiasis control.

7. Am J Trop Med Hyg. 2020 Nov 23. Online ahead of print.

Lassa Fever: An Evolving Emergency in West Africa

Oluwafemi O Balogun et al, Department of Global Health, Boston University School of Public Health, Boston, Massachusetts

Lassa fever remains endemic in parts of West Africa and continues to pose as a quiescent threat globally. We described the background on Lassa fever, factors contributing to its emergence and spread, preventive measures, and potential solutions. This review provides a holistic and comprehensive source for academicians, clinicians, researchers, policymakers, infectious disease epidemiologists, virologists, and other stakeholders.

8. Emerg Infect Dis. 2020 Nov;26(11):2638-2650.

High Dengue Burden and Circulation of 4 Virus Serotypes among Children with Undifferentiated Fever, Kenya, 2014-2017

Melisa M Shah et al,

Little is known about the extent and serotypes of dengue viruses circulating in Africa. We evaluated the presence of dengue viremia during 4 years of surveillance (2014-2017) among children with febrile illness in Kenya. Acutely ill febrile children were recruited from 4 clinical sites in western and coastal Kenya, and 1,022 participant samples were tested by using a highly sensitive real-time reverse transcription PCR. A complete case analysis with genomic sequencing and phylogenetic analyses was conducted to characterize the presence of dengue viremia among participants during 2014-2017. Dengue viremia was detected in 41.9% (361/862) of outpatient children who had undifferentiated febrile illness in Kenya. Of children with confirmed dengue viremia, 51.5% (150/291) had malaria parasitemia. All 4 dengue virus serotypes were detected, and phylogenetic analyses showed several

viruses from novel lineages. Our results suggests high levels of dengue virus infection among children with undifferentiated febrile illness in Kenya.

9. BMJ 2020;371:m4357 Practice Uncertainties

How to optimise duration of antibiotic treatment in patients with sepsis?

TP Hellyer, et al., Newcastle University, Newcastle, UK
Correspondence to paul.m.dark@manchester.ac.uk

Sepsis occurs when the body's response to infection is imbalanced. It can result in life threatening organ dysfunction. About 49 million patients had sepsis worldwide in 2017 and 11 million people died of the condition. Among those hospitalised with sepsis, 17% die in hospital and a further 15% die within a year of hospital discharge. Antibiotics represent the cornerstone of treatment. The Surviving Sepsis Campaign (SSC) consensus guidelines recommend treatment for 7 to 10 days, but this is a weak recommendation. Use of antibiotics risks the emergence of antimicrobial resistance and antibiotic-associated infections, such as Clostridiodes difficile. Patients may suffer from toxic effects of the drugs. Balancing the need to treat severe infections effectively against the risks of overuse of antibiotics is central to the principle of antibiotic stewardship. For severe covid-19, antibiotic stewardship remains important for critically ill patients with pneumonitis and sepsis who are commonly treated with broad spectrum antibiotics. Antibiotic overuse in sepsis results in substantial risk of acquiring difficult-to-treat infections, with further risk of sepsis and poor patient outcomes.

What you need to know

Guidelines recommend 7 to 10 days of antibiotic treatment for patients with sepsis, but a shorter duration may be safe in certain individuals

Low quality evidence suggests that monitoring biomarkers such as procalcitonin can reduce antibiotic duration in sepsis by about one day, but the effectiveness in severe disease and in low resource settings is not known

Use your clinical judgement to consider the diagnostic evidence, signs of resolution or worsening of infection, and individual risk when making a decision about the choice and duration of antibiotic treatment.

COVID-19

10. Lancet 2020;396(10265):1777 Editorial

An African plan to control COVID-19 is urgently needed

As governments in countries hit hardest by COVID-19 prepare vaccination programmes against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), other nations face a more uncertain future. In Africa, for example, the pandemic continues to grow, but heterogeneously. Cases are rising sharply in Morocco, Tunisia, Algeria, Libya, Egypt, and South Africa. But in Africa's most populous nation, Nigeria, WHO reports only 1173 deaths from COVID-19. Although data are sparse, the first wave of the pandemic seemed to peak in early August. Numbers of COVID-19 deaths declined through September, but the disease has been stubbornly persistent since then, burning slowly through communities throughout the continent. As of Dec 1, WHO reports 1·5 million cases and 33 573 deaths from COVID-19.

Despite the diversity of the pandemic in Africa, and the fact that many countries appear to have been spared the human calamity that has afflicted so many nations elsewhere, the continent still needs a vaccination plan. COVID-19 is a global health emergency that demands a global solution. No community is safe from SARS-CoV-2 unless all communities are protected. Further national lockdowns to drive down the prevalence of the virus will not provide a permanent answer to the epidemic threat. With tens of millions of Africans plunged into extreme poverty by COVID-19, further mandates to shut down economies will precipitate humanitarian and health crises.

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COVAX, the Gavi-led financing mechanism to provide COVID-19 vaccines to low-income and middle-income countries (LMICs), plans to have 2 billion doses of vaccine available by the end of 2021. 97 high-income countries have now signed up to the initiative and 92 LMICs—including most African countries—will be supported by the plan. COVAX aims to secure enough doses of any

vaccine to provide protection to an initial 20% of people in signatory countries. That level of coverage may help with the immediate aim of protecting the most at risk, but it is insufficient to achieve herd immunity. For a virus whose R0 is 2·5, around 60% of the population would need to be vaccinated to extinguish community transmission. And that figure assumes a perfect vaccine. For a vaccine with an efficacy of 90%, the proportion of the population to be vaccinated rises to 67%. If a vaccine with an even lower efficacy is used, the proportion will rise still further. The University of Oxford–AstraZeneca partnership has pledged to supply COVAX with “hundreds of millions of doses” of their vaccine, which—importantly for African countries—needs only the standard 2–8°C cold chain.
In July, the African Union Commission and the African Centre for Disease Control and Prevention launched a safety-net strategy to secure access to vaccines and treatments for countries on the continent. The Consortium for COVID-19 Vaccine Clinical Trials (CONCVACT) has already set up several Africa-based clinical trials of vaccines and scaled up production of both testing and diagnostic facilities. CONCVACT has orchestrated pan-African cooperation, set up information-sharing platforms, and led the creation of technical capacity for screening and surveillance.
Despite these advances, the vaccination of two-thirds of Africa's 1·2 billion population will still require huge investment and faces substantial logistical challenges. According to a WHO analysis, the African region has an average score of 33% readiness for a SARS-CoV-2 vaccine roll-out—far below the necessary 80% benchmark. The estimated cost of delivering a vaccine to priority populations alone is estimated to be around US$5·7 billion—and this figure does not include the additional cost of injection materials and other consumables.
Further concerns include transparency and patent protection. Médecins Sans Frontières (MSF) points out that the six front-running COVID-19 vaccine candidates have had $12 billion of taxpayer's money invested in their development. Yet vaccine deals with countries are often “shrouded in secrecy”, MSF argues. There have also been calls to waive intellectual property rights on COVID-19 vaccines. India and South Africa first made the request in October. A waiver would help ensure more equitable access to a vaccine and could be a turning point in the pandemic for nations with few resources.
Whether existing initiatives will translate into an effective and universal COVID-19 vaccination programme for Africa remains to be seen. But as the governments of wealthy countries push their way to the front of the vaccine queue, their leaders would do well to remember that without a vaccine plan for African countries and other nations with resource constraints, the protection of their citizens from COVID-19 will be an illusory victory.
For more on African countries’ readiness for vaccination see: https://www.afro.who.int/news/ who-urges-african-countries- ramp-readiness-covid-19- vaccination-drive

11. Lancet 2020;396(10265):1790-1

World Report
South Africa and India push for COVID-19 patents ban
Usher, AD.
They want the WTO to temporarily suspend intellectual property rights so that COVID-19 vaccines and other new technologies are accessible for poor countries. Ann Danaiya Usher reports.
South Africa and India have called for the World Trade Organization (WTO) to suspend intellectual property (IP) rights related to COVID-19 to ensure that not only the wealthiest countries will be able to access and afford the vaccines, medicines, and other new technologies needed to control the pandemic. The pharmaceutical industry and many high-income countries (HICs) staunchly oppose the move, which they say will stifle innovation when it is needed most.
Without special measures, proponents argue, rich countries will benefit from new technologies as they come onto the market, while poor nations continue to be devastated by the pandemic. The proposal states that IP rights such as patents are obstructing affordable COVID-19 medical products. A temporary ban would allow multiple actors to start production sooner, instead of having manufacturing concentrated in the hands of a small number of patent holders.
WTO decisions are normally reached through consensus. Dozens of low- income and middle-income countries (LMICs) support the proposal. How- ever, HICs including the UK, the USA, Canada, Norway, and the EU have rejected it outright, saying that the IP system is required to incentivise new inventions of vaccines, diagnostics, and treatments, which might dry up in its absence. They dismiss the claim that IP is a barrier to access, and argue that equitable access can be achieved through

voluntary licensing, technology transfer arrangements, and the donor-funded COVAX Advance Market Commitment for vaccines.
The patent waiver proposal was presented to the WTO's Trade-Related Aspects of Intellectual Property (TRIPS) Council on Oct 16, 2020, and discussed again at a council meeting on Nov 20. There, the South African Government responded to objections, pointing to examples of how IP has created barriers to access.
MSF has been advocating for a waiver on COVID-19 patents for several months, arguing that it is justified on emergency health grounds and necessary for LMICs that cannot afford to pay HIC prices for vaccines and treatments.
The co-sponsors of the patent waiver proposal say COVAX, funded through donations from HICs, is insufficient for ensuring timely and equitable access to COVID-19 products. COVAX aims to procure 2 billion doses of vaccine and to share them equally between HICs and LMICs. However, according to data collected by Duke University, the COVAX Facility has reserved only 700 000 vaccine doses so far. By comparison, HICs have reserved 6 billion doses for themselves through bilateral deals with pharmaceutical companies. Low- income countries, meanwhile, with a combined population of 1·7 billion people, have not yet signed a single bilateral vaccine deal.
COVAX is part of a larger effort, the Access to COVID-19 Tools Accelerator (ACT-A), to supply not only vaccines, but also new medicines such as monoclonal antibodies, diagnostic tests, personal protective equipment, and oxygen to LMICs.
Given the entrenched positions on the proposal, reaching a consensus in the TRIPS Council is unlikely. Putting the matter to a vote is theoretically possible, but members have never let it happen in the past, and they are unlikely to do so now, says Peter Ungphakorn, former senior information officer at the WTO Secretariat.

12. Am J Trop Med Hyg 2020 Nov;103(5):1762-1764.

What COVID-19 Reveals about the Neglect of WASH within Infection Prevention in Low-Resource Healthcare Facilities
Joanne A McGriff et al, The Center for Global Safe, Water, Sanitation and Hygiene, Rollins School of Public Health, Emory University, Atlanta, Georgia.
The highly infectious nature of the SARS-CoV-2 virus requires rigorous infection prevention and control (IPC) to reduce the transmission of COVID-19 within healthcare facilities, but in low-resource settings, the lack of water access creates a perfect storm for low-handwashing adherence, ineffective surface decontamination, and other environmental cleaning functions that are critical for IPC compliance. Data from the WHO/UNICEF Joint Monitoring Programme show that one in four healthcare facilities globally lacks a functional water source on premises (i.e., basic water service); in sub-Saharan Africa, half of all healthcare facilities have no basic water services. But even these data do not tell the whole story, other water, sanitation, and hygiene (WASH) assessments in low-resource healthcare facilities have shown the detrimental effects of seasonal or temporary water shortages, nonfunctional water infrastructure, and fluctuating water quality. The rapid spread of COVID-19 forces us to reexamine prevailing norms within national health systems around the importance of WASH for quality of health care, the prioritization of WASH in healthcare facility investments, and the need for focused, cross-sector leadership and collaboration between WASH and health professionals. What COVID-19 reveals about infection prevention in low-resource healthcare facilities is that we can no longer afford to "work around" WASH deficiencies. Basic WASH services are a fundamental prerequisite to compliance with the principles of IPC that are necessary to protect patients and healthcare workers in every setting.

13. Am J Trop Med Hyg . 2020 Nov 11. Online ahead of print.

Fighting COVID-19 at the Expense of Malaria in Africa: The Consequences and Policy Options
Abdullahi Tunde Aborode et al, Healthy Africans Platform, Research and Development Hub, Ibadan, Nigeria.
Malaria remains a major global health burden, killing hundreds of thousands annually, especially in sub-Saharan Africa. In December 2019, a novel illness termed COVID-19, caused by SARS-CoV-2, was reported in China. This disease soon spread around the world and was declared a pandemic by the WHO on March 11, 2020. Considering that the malaria burden is high in many low-income tropical

countries with little capacity to fund malaria control and eradication programs, the fight against malaria in these regions is likely to be hindered by COVID-19. Indeed, access to health care has generally been limited during the pandemic, whereas malaria interventions, such as seasonal malaria chemoprevention, and distribution of long-lasting insecticide-treated bed nets, have been suspended because of lockdowns. Likewise, the repurposing of antimalarials for the treatment of COVID-19 and a shift in focus from the production of malaria rapid diagnostic tests to COVID-19 rapid diagnostic tests are causes for concern in malaria-endemic regions. COVID-19 has disproportionately affected developed countries, threatening their capacity to aid in malaria control efforts. Here, we address impacts of the COVID-19 pandemic on the management and control of malaria in Africa.

14. BMJ 2020;370:m3379 Practice Rapid Recommendations

A living WHO guideline on drugs for covid-19

Bram Rochwerg, methods chair remdesivir, critical care physician et al., rochwerg@mcmaster.ca Michael Jacobs michael.jacobs@ucl.ac.uk

Abstract

Clinical question What is the role of drug interventions in the treatment of patients with covid-19?

New recommendation The latest version of this WHO living guidance focuses on remdesivir, following the 15 October 2020 preprint publication of results from the WHO SOLIDARITY trial. It contains a weak or conditional recommendation against the use of remdesivir in hospitalised patients with covid-19

Recommendations The first version on this living guidance focused on corticosteroids. The strong recommendation for systemic corticosteroids in patients with severe and critical covid-19, and a weak or conditional recommendation against systemic corticosteroids in patients with non-severe covid-19 are unchanged.

Understanding the new recommendation When moving from evidence to the conditional recommendation against the use of remdesivir in patients with covid-19, the panel emphasised the evidence suggesting no important effect on mortality, need for mechanical ventilation, time to clinical improvement, and other patient-important outcomes. Considering the low or very low certainty evidence for all outcomes, the panel interpreted the evidence as not proving that remdesivir is ineffective; rather, there is no evidence based on currently available data that it does improve patient-important outcomes. The panel placed low value on small and uncertain benefits in the presence of the remaining possibility of important harms. In addition, the panel considered contextual factors such as resources, feasibility, acceptability, and equity for countries and health care systems.

Updates This is a living guideline. It replaces an earlier version published on 4 September 2020 and the BMJ Rapid Recommendations on remdesivir published on 2 July 2020, and the previous version can be found as a data supplement. Future updates are planned to cover hydroxychloroquine and lopinavir-rotinavir. New recommendations will be published as updates to this guideline.

Readers note This version is update 1 of the living guideline (BMJ 2020;370:m3379). When citing this article, please consider adding the update number and date of access for clarity.

15. http://dx.doi.org/10.1136/bmjgh-2020-003097

Original research

Infection and mortality of healthcare workers worldwide from COVID-19: a systematic review

Soham Bandyopadhyay et al., Oxford University Global Surgery Group, Nuffield Department of Surgical Sciences, University of Oxford, Oxford, Oxfordshire, UK

Abstract

Objectives: To estimate COVID-19 infections and deaths in healthcare workers (HCWs) from a global perspective during the early phases of the pandemic.

Design: Systematic review.

Methods: Two parallel searches of academic bibliographic databases and grey literature were undertaken until 8 May 2020. Governments were also contacted for further information where possible. There were no restrictions on language, information sources used, publication status and types of sources of evidence. The AACODS checklist or the National Institutes of Health study quality assessment tools were used to appraise each source of evidence.

Outcome measures: Publication characteristics, country-specific data points, COVID-19-specific data, demographics of affected HCWs and public health measures employed.
Results: A total of 152 888 infections and 1413 deaths were reported. Infections were mainly in women (71.6%, n=14 058) and nurses (38.6%, n=10 706), but deaths were mainly in men (70.8%, n=550) and doctors (51.4%, n=525). Limited data suggested that general practitioners and mental health nurses were the highest risk specialities for deaths. There were 37.2 deaths reported per 100 infections for HCWs aged over 70 years. Europe had the highest absolute numbers of reported infections (119 628) and deaths (712), but the Eastern Mediterranean region had the highest number of reported deaths per 100 infections (5.7).
Conclusions: COVID-19 infections and deaths among HCWs follow that of the general population around the world. The reasons for gender and specialty differences require further exploration, as do the low rates reported in Africa and India. Although physicians working in certain specialities may be considered high risk due to exposure to oronasal secretions, the risk to other specialities must not be underestimated. Elderly HCWs may require assigning to less risky settings such as telemedicine or administrative positions. Our pragmatic approach provides general trends, and highlights the need for universal guidelines for testing and reporting of infections in HCWs.

Health Policy

16. TMIH 2020;25(11):1328–31

Editorial Mobile pastoralists in Africa: a blind spot in global health surveillance
Wild H et al., Stanford University School of Medicine, Stanford, CA, USA
Introduction. Mobile pastoralists subsist primarily on herds of livestock such as camels, cattle and goats, migrating seasonally to access water and grazing areas. Speculative estimates of their global population have ranged from 50–200 million, while others have suggested that the number of pastoralists in Africa alone may equal these figures. Pastoralists inhabit wide swaths of remote and ecologically harsh terrain in Asia, the Middle East, and North and Sub-Saharan Africa. Due to close contact with their herds, pastoralists have frequent exposure to animal reservoirs of pathogens with emerging epidemic potential. Areas inhabited by sizeable populations in countries including Nigeria, Niger, Democratic Republic of the Congo (DRC), Central African Republic (CAR), Cameroon, Chad, Mali, Ethiopia and Kenya overlap with a belt of emerging infectious disease 'hotspots' as well as regions of volatile endemic conflict, exacerbated by the rise of transnational terrorist activity. These dynamics have alarming implications for the ability to mount an effective epidemiologic response in regions where already weak health infrastructure is crippled by protracted conflict and insecurity. Despite these risks, pastoralists' access to health services designed for stationary populations is limited, due in part to constraints posed by their mobility and the daily labour requirements of managing livestock. Pastoralists' subsistence strategies and sociocultural practices may also pose challenges to utilisation of formal healthcare facilities. Moreover, pastoralist communities are largely invisible to health surveillance systems, which are not structured to capture mobile populations or transhumance crossing national borders. As a result, pastoralist communities are a blind spot in global health surveillance capacity. Yet, the risks of inadequate surveillance in pastoralist regions have been given limited consideration. While strides have been made towards Sustainable Development Goals (SDGs) and Universal Health Coverage (UHC) for populations globally, pastoralists have been left behind in this progress. Though individual governments and NGOs have made efforts to extend health care to pastoralist communities, these strategies have had mixed success and have not been integrated with health surveillance and delivery systems on a national scale. Little has changed since the last focused editorial on pastoralists' integration in health systems, written nearly fifteen years ago.
Roadmap: potential solutions.
Household surveys must implement alternatives to census-based sampling frames.
Coordinate vaccination outreach and other interventions with seasonal and conflict-related transhumance.
Integrate human and animal health surveillance and service delivery.
Engage in participatory stakeholder processes to identify priorities for disease surveillance and response.

Leverage advances in diagnostic technologies and therapeutics.
Conclusion. Recent arguments to embed global health security in the concept of UHC highlight the exclusion of entire populations from either initiative. Three years after the adoption of the 2030 Agenda for Sustainable Development by UN Member States, pastoralists are being left behind. The implications for health equity are un acceptable. In a modern context, technical and methodologic advances mitigate many of the logistical obstacles to pro-visioning mobile pastoralists with health services. It is time to address the blind spot: integrating nomadic populations in universal health coverage, including household surveys and health surveillance, is an attainable goal.

Related article for further reading:
TMIH 2020;25(11):1332-52
Review
Health interventions among mobile pastoralists: a systematic review to guide health service design
Wild H et al., Stanford University School of Medicine, Stanford, CA, USA

17. Lancet. 2020 Oct 17;396(10258):1250-1284. Epub 2020 Aug 27.
Measuring universal health coverage based on an index of effective coverage of health services in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019
GBD 2019 Universal Health Coverage Collaborators
Background: Achieving universal health coverage (UHC) involves all people receiving the health services they need, of high quality, without experiencing financial hardship. Making progress towards UHC is a policy priority for both countries and global institutions, as highlighted by the agenda of the UN Sustainable Development Goals (SDGs) and WHO's Thirteenth General Programme of Work (GPW13). Measuring effective coverage at the health-system level is important for understanding whether health services are aligned with countries' health profiles and are of sufficient quality to produce health gains for populations of all ages.
Methods: Based on the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019, we assessed UHC effective coverage for 204 countries and territories from 1990 to 2019. Drawing from a measurement framework developed through WHO's GPW13 consultation, we mapped 23 effective coverage indicators to a matrix representing health service types and five population-age groups spanning from reproductive and newborn to older adults (≥65 years). Effective coverage indicators were based on intervention coverage or outcome-based measures such as mortality-to-incidence ratios to approximate access to quality care; outcome-based measures were transformed to values on a scale of 0-100 based on the 2·5th and 97·5th percentile of location-year values. We constructed the UHC effective coverage index by weighting each effective coverage indicator relative to its associated potential health gains, as measured by disability-adjusted life-years for each location-year and population-age group. For three tests of validity (content, known-groups, and convergent), UHC effective coverage index performance was generally better than that of other UHC service coverage indices from WHO (ie, the current metric for SDG indicator 3.8.1 on UHC service coverage), the World Bank, and GBD 2017.
Findings: Globally, performance on the UHC effective coverage index improved from 45·8 (95% uncertainty interval 44·2-47·5) in 1990 to 60·3 (58·7-61·9) in 2019, yet country-level UHC effective coverage in 2019 still spanned from 95 or higher in Japan and Iceland to lower than 25 in Somalia and the Central African Republic. Since 2010, sub-Saharan Africa showed accelerated gains on the UHC effective coverage index (at an average increase of 2·6% [1·9-3·3] per year up to 2019); by contrast, most other GBD super-regions had slowed rates of progress in 2010-2019 relative to 1990-2010.
Interpretation: The present study demonstrates the utility of measuring effective coverage and its role in supporting improved health outcomes for all people-the ultimate goal of UHC and its achievement. Global ambitions to accelerate progress on UHC service coverage are increasingly unlikely unless concerted action on non-communicable diseases occurs and countries can better translate health spending into improved performance. Focusing on effective coverage and accounting for the world's evolving health needs lays the groundwork for better understanding how close-or how far-all populations are in benefiting from UHC.

18. Health Policy and Planning, Vol 35 (8): 900–905

Juridification of maternal deaths in Ethiopia: a study of the Maternal and Perinatal Death Surveillance and Response (MPDSR) system

Andrea Melberg, et al. Centre for International Health, University of Bergen, Norway. Corresponding author. E-mail: andrea.melberg@uib.no

Juridification of maternal health care is on the rise globally, but little is known about its manifestations in resource constrained settings in sub-Saharan Africa. The Maternal and Perinatal Death Surveillance and Response (MPDSR) system is implemented in Ethiopia to record and review all maternal and perinatal deaths, but underreporting of deaths remains a major implementation challenge. Fear of blame and malpractice litigation among health workers are important factors in underreporting, suggestive of an increased juridification of birth care. By taking MPDSR implementation as an entry point, this article aims to explore the manifestations of juridification of birth care in Ethiopia. Based on multi-sited fieldwork involving interviews, document analysis and observations at different levels of the Ethiopian health system, we explore responses to maternal deaths at various levels of the health system. We found an increasing public notion of maternal deaths being caused by malpractice, and a tendency to perceive the juridical system as the only channel to claim accountability for maternal deaths. Conflicts over legal responsibility for deaths influenced birth care provision. Both health workers and health bureaucrats strived to balance conflicting concerns related to the MPDSR system: reporting all deaths vs revealing failures in service provision. This dilemma encouraged the development of strategies to avoid personalized accountability for deaths. In this context, increased juridification impacted both care and reporting practices. Our study demonstrates the need to create a system that secures legal protection of health professionals reporting maternal deaths as prescribed and provides the public with mechanisms to claim accountability and high-quality birth care services.

19. Health Policy and Planning, Vol 35 (8): 1039–1052

The distinctive roles of urban community health workers in low- and middle-income countries: a scoping review of the literature

Teralynn Ludwick, et al. Corresponding author. Nossal Institute for Global Health, Melbourne School of Population and Global Health. E-mail: teralynn.ludwick@unimelb.edu.au

Addressing urban health challenges in low- and middle-income countries (LMICs) has been hampered by lack of evidence on effective mechanisms for delivering health services to the poor. The urban disadvantaged experience poor health outcomes (often worse than rural counterparts) and face service barriers. While community health workers (CHWs) have been extensively employed in rural communities to address inequities, little attention has been given to understanding the roles of CHWs in urban contexts. This study is the first to systematically examine urban CHW roles in LMICs. It aims to understand their roles vis-à-vis other health providers and raise considerations for informing future scope of practice and service delivery models. We developed a framework that presents seven key roles performed by urban CHWs and position these roles against a continuum of technical to political functions. Our scoping review included publications from four databases (MEDLINE, EMBASE, CINAHL and Social Sciences Citation Index) and two CHW resource hubs. We included all peer-reviewed, CHW studies situated in urban/peri-urban, LMIC contexts. We identify roles (un)commonly performed by urban CHWs, present the range of evidence available on CHW effectiveness in performing each role and identify considerations for informing future roles. Of 856 articles, 160 met the inclusion criteria. Programmes spanned 34 LMICs. Studies most commonly reported evidence on CHWs roles related to health education, outreach and elements of direct service provision. We found little overlap in roles between CHWs and other providers, with some exceptions. Reported roles were biased towards home visiting and individual-capacity building, and not well-oriented to reach men/youth/working women, support community empowerment or link with social services. Urban-specific adaptations to roles, such as peer outreach to high-risk, stigmatized communities, were limited. Innovation in urban CHW roles and a better understanding of the unique opportunities presented by urban settings is needed to fully capitalize on their potential.

20. Health Policy and Planning, Vol 35 (Issue_supplement_1): i1 – i3

Enhancing diversity in public health scholarship: the role of publication mentorship

Dena Javadi, Sameera Hussain. Corresponding author. Public Health Agency of Canada, Ottawa, Canada. E-mail: sameera.hussain.seraj@gmail.com

KEY MESSAGES

Women and other groups facing structural barriers are underrepresented in research, scholarship and leadership.

Culturally responsive mentorship can serve as part of a solution in strengthening capacity and enhancing social capital in academic and research settings.

The increased diversity of perspectives and thought afforded by improved representation strengthens public health scholarship and its contributions to social justice.

Introduction

This Supplement, a collaboration between Health Systems Global (HSG) and the Alliance for Health Policy and Systems Research (AHPSR) and Health Policy and Planning (HPP), is the product of a six-month publication mentorship programme aimed at supporting early-career women conducting Health Policy and Systems Research (HPSR) in low- and middle-income countries (LMICs) (AHPSR, 2019). The mentorship programme guided mentees—selected based on a motivation letter and draft abstract—in preparing a high-quality manuscript for a peer-reviewed journal. Topics for submitted papers were restricted to themes identified for the Sixth Global Symposium on Health Systems Research on 'Re-imagining health systems for better health and social justice' (HSR, 2020).

This editorial will discuss the role of programmes such as publication mentorship in mitigating structural barriers in the career advancement of women, racial and ethnic minorities and others experiencing discrimination and bias. It will also highlight the social justice and equity-oriented themes that connect the papers included in the special issue, demonstrating the importance of amplifying voices that are often underrepresented in scholarship and leadership.

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Conclusion

The papers featured in this special issue are a product of collaboration and mentoring relationships between early-career researchers and those established in HPSR, and the editorial team at HPP. The range of topics and contexts they cover demonstrates the value of diversity in research and scholarship.

The COVID-19 pandemic has further highlighted disparities in research output experienced by women (Malisch et al., 2020). This is in part due to the unintended consequences of public health measures implemented worldwide, leading to exacerbated disparities in gender roles and caregiving obligations, compounded by the lack of social support systems. Academic institutions, donors and journals all have a role to play in addressing these inequities and enriching global scholarship through creating more inclusive academic and research spaces.

21. Health Policy and Planning, Vol 35 (Issue_supplement_2): ii1 – ii3

Editorial: Implementation research in LMICs—evolution through innovation

Kabir Sheikh, et al. Corresponding author. Alliance for Health Policy and Systems Research, World Health Organization. E-mail: ksheikh@who.int

Major global health gains can be achieved by strengthening the delivery of public health policies and programmes in low- and middle-income countries (LMICs). The population impact of evidence-based technologies and interventions such as drugs, vaccines and health know-how can only be maximized where programmes optimally identify and reach target populations and support them to take up and sustain their effective use. Examples include significant gaps in the coverage and quality of maternal health, newborn, immunization, non-communicable disease, primary care and adolescent sexual and reproductive health services—all issues tackled in this supplement. While structural change and increased funding are essential, much can be gained through ongoing improvements in programme delivery (Paina and Peters, 2012). Implementation gaps are also widely implicated in the failure of broader health policies and reforms in LMICs (Haines et al., 2004), such as for decentralization, health care regulation and primary health care. This makes it important also to analyse the implementation of policies at all levels, including studying the negotiations and interactions of actors in social and

political contexts, understanding gaps in the effectiveness of public policies and helping to resolve them.
Rigorous scientific studies of the implementation and effectiveness of public health programmes and policies delivered in real-life settings have long been acknowledged to be critical to accelerating impact and fostering innovation in this area (Fixsen et al., 2005). This area of enquiry interchangeably referred to as implementation research (IR) and implementation science has captured widespread attention. Taking IR to scale is essential to support the delivery of public health programmes and broader reforms such as Universal Health Coverage. This supplement, 'Innovations in Implementation Research in Low- and Middle-Income Countries' showcases innovations in IR that are enhancing its value, shaping its development and fuelling the growth of the field. Specifically, we look to innovations that are occurring in LMIC contexts—where IR has the greatest potential to have impact. It does not seek to define IR, since we recognize that numerous authoritative texts have done so already. The supplement is a joint production of Health Policy and Planning and the Alliance for Health Policy and Systems Research.
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The supplement consists of 12 articles that present innovations in the methods, approaches and governance of research on the implementation of public health policies and programmes in LMICs. Each of the papers illustrates the concept and usefulness of IR in different ways and this mix highlights its transdisciplinary character—defined by the real-world implementation challenges that it seeks to address and deploying a range of methodological inputs to analyse and tackle them. Two commentaries, one by country policymakers who have played roles in institutionalizing IR in their countries, and other by the leadership of WHO on the significance of IR in promoting cultures and practices of learning in health systems, complement the research articles. We hope that this supplement will help shape the trajectory of the development of the field and more importantly, help to chart the way forward for the further application of IR to maximize its impact on policies and programmes in the real world.

22. http://dx.doi.org/10.1136/bmjgh-2020-003801 Editorial

On the path to Universal Health Coverage: aligning ongoing health systems reforms in India
Zubin C Shroff et al., Alliance for Health Policy and Systems Research, World Health Organization, Geneva, Switzerland Correspondence to Dr Zubin C Shroff; shroffz@who.int
The health of India's population has witnessed significant improvements over the past two decades. The infant mortality rate (IMR) has fallen from over 71 per 1000 live births in 1998 to 31 per 1000 live births in 2017. Maternal mortality has declined even more dramatically, from 540 maternal deaths in 1998 to 170 maternal deaths per 100 000 live births in 2013, a fall of close to 70%. These reductions in mortality have been accompanied by a major shift in India's disease burden. Non-communicable diseases (NCDs) such as heart disease, diabetes and cancer, which accounted for 30% of disease burden in 1990, represented over 55% of the disease burden in 2016, while communicable, maternal and child diseases accounted for nearly one-third of the burden.
Addressing these rapid shifts requires a fit-for-purpose health system to move towards Universal Health Coverage (UHC). The Government of India launched the Ayushman Bharat Programme in 2018, a potentially important step in this direction with two major components. First, primary healthcare improvements through investment in 150 000 Health and Wellness Centres (HWCs) and a new cadre of mid-level health providers, accredited for primary care and public health competencies. Over 38 000 HWCs were functional as of April 2020. Second, an insurance mechanism, the Pradhan Mantri Jan Arogya Yojana (PM-JAY), which aims to cover hospital-level care in both public and private hospitals for over 100 million poor families. PM-JAY has reimbursed over 9.5 million hospitalisation events since its launch in September 2018 Both these components are largely financed through general tax revenues.
However, this latest reform to move India closer to UHC requires alignment between its component parts. The importance of such alignment is exemplified in the ongoing response to the COVID-19 pandemic which demands close coordination across community, primary and tertiary levels of care. In this editorial, we argue that the long-term success of this reform requires, in particular, greater alignment of service delivery, provider payment mechanisms and information systems.
Conclusion

The alignment of service delivery approaches, provider payment mechanisms and information systems described previously will be crucial in building people's trust and public confidence. The long-term success of India's reform towards UHC depends on the PM-JAY being connected to a well-functioning and adequately staffed primary healthcare system that goes beyond curative care to encompass broader health promotion and prevention efforts which are necessary to improve population health. Investments in developing new cadres such as mid-level health providers will need to be complemented by policies to ensure their appropriate distribution and deployment. In addition, a robust and comprehensive information system is a pre-requisite both for effective referral and well-functioning provider payment systems.

23. http://dx.doi.org/10.1136/bmjgh-2020-003092

Targeting anticorruption interventions at the front line: developmental governance in health systems (3 December, 2020)

Eleanor Hutchinson, et al., Department of Global Health and Development, Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine, London, UK

Abstract

In 2008, Vian reported an increasing interest in understanding how corruption affects healthcare outcomes and asked what could be done to combat corruption in the health sector. Eleven years later, corruption is seen as a heterogeneous mix of activity, extensive and expensive in terms of loss of productivity, increasing inequity and costs, but with few examples of programmes that have successfully tackled corruption in low-income or middle-income countries. The commitment, by multilateral organisations and many governments to the Sustainable Development Goals and Universal Health Coverage has renewed an interest to find ways to tackle corruption within health systems. These efforts must, however, begin with a critical assessment of the existing theoretical models and approaches that have underpinned action in the health sector in the past and an assessment of the potential of innovations from anticorruption work developed in sectors other than health. To that end, this paper maps the key debates and theoretical frameworks that have dominated research on corruption in health. It examines their limitations, the blind spots that they create in terms of the questions asked, and the capacity for research to take account of contextual factors that drive practice. It draws on new work from heterodox economics which seeks to target anticorruption interventions at practices that have high impact and which are politically and economically feasible to address. We consider how such approaches can be adopted into health systems and what new questions need to be addressed by researchers to support the development of
sustainable solutions to corruption. We present a short case study from Bangladesh to show how such an approach reveals new perspectives on actors and drivers of corruption practice. We conclude by considering the most important areas for research and policy.

24. Review Lancet. 2020 Dec 1;S0140-6736(20)32228-5. Online ahead of print.

Fragmented health systems in COVID-19: rectifying the misalignment between global health security and universal health coverage

Arush Lal et al, Department of Health Policy, London School of Economics and Political Science, London, UK; Women in Global Health, Washington, DC, USA. Electronic address: arush.lal@gmail.com.

The COVID-19 pandemic has placed enormous strain on countries around the world, exposing long-standing gaps in public health and exacerbating chronic inequities. Although research and analyses have attempted to draw important lessons on how to strengthen pandemic preparedness and response, few have examined the effect that fragmented governance for health has had on effectively mitigating the crisis. By assessing the ability of health systems to manage COVID-19 from the perspective of two key approaches to global health policy-global health security and universal health coverage-important lessons can be drawn for how to align varied priorities and objectives in strengthening health systems. This Health Policy paper compares three types of health systems (ie, with stronger investments in global health security, stronger investments in universal health coverage, and integrated investments in global health security and universal health coverage) in their response to the ongoing COVID-19 pandemic and synthesises four essential recommendations (ie, integration, financing, resilience, and

equity) to reimagine governance, policies, and investments for better health towards a more sustainable future.

Hygiene and sanitation

25. Am J Trop Med Hyg 2020 Oct;103(4):1735-1741.

Effect of a Community-Led Total Sanitation Intervention on Sanitation and Hygiene in Pallisa District, Uganda

Charles Dickens Okolimong et al, Pallisa District Local Government, Pallisa, Uganda.

We conducted a comparative cross-sectional study to examine the potential effects of a community-led total sanitation (CLTS) intervention on sanitation and hygiene in Pallisa district in Uganda. Quantitative data were collected from households using a semi-structured questionnaire and an observation checklist, entered and analyzed using univariate, bivariate, and multivariate analyses. Overall, knowledge on sanitation and hygiene was significantly higher (64.5%; 129/200) among households in the CLTS intervention than among those in the nonintervention subcounties (54.0%; 108/200) (P = 0.033). Latrine quality was rated as fair in a majority (73.3%; 143/195) of the CLTS intervention households compared with 50.8% (93/183) in the non-CLTS households (P < 0.001). Latrine cleanliness was rated as good in more than a half (51.3%; 100/195) of households in the intervention area, whereas only 13.7% (25/183) for the nonintervention area (P < 0.001). In this study, 35.0% (70/200) of the households in the intervention subcounty had attained open defecation-free (ODF) status compared with only 6.0% (12/200) in the nonintervention subcounty (P < 0.001). Level of knowledge on hygiene and sanitation (adjusted odd ratio [AOR]: 2.23; 95% CI: 1.24-4.03) and CLTS status (AOR: 8.89; 95% CI: 4.26-18.56) were significantly associated with achievement of ODF status in the multivariate analysis. The mean cases of diarrhea were significantly lower in CLTS implementing (subcounty (0.42 [SD ± 1.03]) than in the non-CLTS implementing subcounty (0.98 [SD ± 1.39]; t = -4.6; P < 0.001). Sanitation and hygiene outcomes were better in the CLTS intervention subcounty than in the non-CLTS intervention subcounty, suggesting that scaling up CLTS could reduce ODF and the burden of diarrheal diseases.

26. Am J Trop Med Hyg 2020 Nov;103(5):2116-2126.

Waterless Hand Cleansing with Chlorhexidine during the Neonatal Period by Mothers and Other Household Members: Findings from a Randomized Controlled Trial

Pavani K Ram et al, State University of New York at Buffalo, Buffalo, New York.

Observational data suggest maternal handwashing with soap prevents neonatal mortality. We tested the impact of a chlorhexidine-based waterless hand cleansing promotion on the behavior of mothers and other household members. In rural Bangladesh in 2014, we randomized consenting pregnant women to chlorhexidine provision and hand cleansing promotion or standard practices. We compared hand cleansing with chlorhexidine or handwashing with soap before baby care, among mothers and household members in the two groups, and measured chlorhexidine use in the intervention arm. Chlorhexidine was observed in the baby's sleep space in 97% of 130 intervention homes, versus soap in 59% of 128 control homes. Hand cleansing before baby care was observed 5.6 times more frequently among mothers in the intervention arm than in the controls (95% CI = 4.0-7.7). Hand cleansing was significantly more frequently observed in the intervention arm among women other than the mother (RR = 10.9) and girls (RR = 37.0). Men and boys in the intervention arm cleansed hands before 29% and 44% of baby care events, respectively, compared with 0% in the control arm. The median number of grams consumed during the neonatal period was 176 (IQR = 95-305 g), about 7.8 g/day (IQR = 4.2-13.8 g). Promotion of waterless chlorhexidine increased hand cleansing behavior among mothers and other household members. Discrepancy between observed use and measured chlorhexidine consumption suggested courtesy bias in structured observations. A waterless hand cleanser may represent one component of the multimodal strategies to prevent neonatal infections in low-resource settings.

Malaria

27. Lancet 2020;396(10265):1829-40

Effectiveness of seasonal malaria chemoprevention at scale in west and central Africa: an observational study

ACCESS-SMC Partnership <paul.milligan@lshtm.ac.uk>

Background. Seasonal malaria chemoprevention (SMC) aims to prevent malaria in children during the high malaria transmission season. The Achieving Catalytic Expansion of SMC in the Sahel (ACCESS-SMC) project sought to remove barriers to the scale-up of SMC in seven countries in 2015 and 2016. We evaluated the project, including coverage, effectiveness of the intervention, safety, feasibility, drug resistance, and cost-effectiveness.

Methods. For this observational study, we collected data on the delivery, effectiveness, safety, influence on drug resistance, costs of delivery, impact on malaria incidence and mortality, and cost-effectiveness of SMC, during its administration for 4 months each year (2015 and 2016) to children younger than 5 years, in Burkina Faso, Chad, The Gambia, Guinea, Mali, Niger, and Nigeria. SMC was administered monthly by community health workers who visited door-to-door. Drug administration was monitored via tally sheets and via household cluster-sample coverage surveys. Pharmacovigilance was based on targeted spontaneous reporting and monitoring systems were strengthened. Molecular markers of resistance to sulfadoxine–pyrimethamine and amodiaquine in the general population before and 2 years after SMC introduction was assessed from community surveys. Effectiveness of monthly SMC treatments was measured in case-control studies that compared receipt of SMC between patients with confirmed malaria and neighbourhood-matched community controls eligible to receive SMC. Impact on incidence and mortality was assessed from confirmed outpatient cases, hospital admissions, and deaths associated with malaria, as reported in national health management information systems in Burkina Faso and The Gambia, and from data from selected outpatient facilities (all countries). Provider costs of SMC were estimated from financial costs, costs of health-care staff time, and volunteer opportunity costs, and cost-effectiveness ratios were calculated as the total cost of SMC in each country divided by the predicted number of cases averted.

Findings. 12 467 933 monthly SMC treatments were administered in 2015 to a target population of 3 650 455 children, and 25 117 480 were administered in 2016 to a target population of 7 551 491. In 2015, among eligible children, mean coverage per month was 76·4% (95% CI 74·0–78·8), and 54·5% children (95% CI 50·4–58·7) received all four treatments. Similar coverage was achieved in 2016 (74·8% [72·2–77·3] treated per month and 53·0% [48·5–57·4] treated four times). In 779 individual case safety reports over 2015–16, 36 serious adverse drug reactions were reported (one child with rash, two with fever, 31 with gastrointestinal disorders, one with extrapyramidal syndrome, and one with Quincke's oedema). No cases of severe skin reactions (Stevens-Johnson or Lyell syndrome) were reported. SMC treatment was associated with a protective effectiveness of 88·2% (95% CI 78·7–93·4) over 28 days in case-control studies (2185 cases of confirmed malaria and 4370 controls). In Burkina Faso and The Gambia, implementation of SMC was associated with reductions in the number of malaria deaths in hospital during the high transmission period, of 42·4% (95% CI 5·9 to 64·7) in Burkina Faso and 56·6% (28·9 to 73·5) in The Gambia. Over 2015–16, the estimated reduction in confirmed malaria cases at outpatient clinics during the high transmission period in the seven countries ranged from 25·5% (95% CI 6·1 to 40·9) in Nigeria to 55·2% (42·0 to 65·3) in The Gambia. Molecular markers of resistance occurred at low frequencies. In individuals aged 10–30 years without SMC, the combined mutations associated with resistance to amodiaquine (pfcrt CVIET haplotype and pfmdr1 mutations [86Tyr and 184Tyr]) had a prevalence of 0·7% (95% CI 0·4–1·2) in 2016 and 0·4% (0·1–0·8) in 2018 (prevalence ratio 0·5 [95% CI 0·2–1·2]), and the quintuple mutation associated with resistance to sulfadoxine–pyrimethamine (triple mutation in pfdhfr and pfdhps mutations [437Gly and 540Glu]) had a prevalence of 0·2% (0·1–0·5) in 2016 and 1·0% (0·6–1·6) in 2018 (prevalence ratio 4·8 [1·7–13·7]). The weighted average economic cost of administering four monthly SMC treatments was US$3·63 per child.

Interpretation. SMC at scale was effective in preventing morbidity and mortality from malaria. Serious adverse reactions were rarely reported. Coverage varied, with some areas consistently achieving high levels via door- to-door campaigns. Markers of resistance to sulfadoxine–pyrimethamine and amodiaquine remained uncommon, but with some selection for resistance to sulfadoxine–

pyrimethamine, and the situation needs to be carefully monitored. These findings should support efforts to ensure high levels of SMC coverage in west and central Africa.

28. Am J Trop Med Hyg 2020 Oct;103(4):1380-1387.

Malaria Transmission, Infection, and Disease following Sustained Indoor Residual Spraying of Insecticide in Tororo, Uganda

Joaniter I Nankabirwa et al, Infectious Diseases Research Collaboration, Kampala, Uganda.

Tororo, a district in Uganda with historically high malaria transmission intensity, has recently scaled up control interventions, including universal long-lasting insecticidal net distribution in 2013 and 2017, and sustained indoor residual spraying (IRS) of insecticide since December 2014. We describe the burden of malaria in Tororo 5 years following the initiation of IRS. We followed a cohort of 531 participants from 80 randomly selected households in Nagongera subcounty, Tororo district, from October 2017 to October 2019. Mosquitoes were collected every 2 weeks using CDC light traps in all rooms where participants slept, symptomatic malaria was identified by passive surveillance, and microscopic and submicroscopic parasitemia were measured every 4 weeks using active surveillance. Over the 2 years of follow-up, 15,780 female anopheline mosquitos were collected, the majority (98.0%) of which were Anopheles arabiensis. The daily human biting rate was 2.07, and the annual entomological inoculation rate was 0.43 infective bites/person/year. Only 38 episodes of malaria were diagnosed (incidence 0.04 episodes/person/year), and there were no cases of severe malaria or malarial deaths. The prevalence of microscopic parasitemia was 1.9%, and the combined prevalence of microscopic and submicroscopic parasitemia was 10.4%, each highest in children aged 5-15 years (3.3% and 14.0%, respectively). After 5 years of intensive vector control measures in Tororo, the burden of malaria was reduced to very low transmission levels. However, a significant proportion of the population remained parasitemic, primarily school-aged children with submicroscopic parasitemia, providing a potential reservoir for malaria transmission.

29. Am J Trop Med Hyg 2020 Oct 19. Online ahead of print.

The Impact of Renewing Long-Lasting Insecticide-Treated Nets in the Event of Malaria Resurgence: Lessons from 10 Years of Net Use in Dielmo, Senegal

Amélé N Wotodjo et al, VITROME, UMR 257 IRD, Campus UCAD-IRD, Dakar, Senegal.

The occurrence of malaria resurgences could threaten progress toward elimination of the disease. This study investigated the impact of repeated renewal of long-lasting insecticide-treated net (LLIN) universal coverage on malaria resurgence over a period of 10 years of net implementation in Dielmo (Senegal). A longitudinal study was carried out in Dielmo between August 2007 and July 2018. In July 2008, LLINs were offered to all villagers through universal campaign distribution which was renewed in July 2011, August 2014, and May 2016. Malaria cases were treated with artemisinin-based combination therapy. Two resurgences of malaria occurred during the 10 years in which LLINs have been in use. Since the third renewal of the nets, malaria decreased significantly compared with the first year the nets were implemented (adjusted incidence rate ratio) (95% CI) = 0.35 (0.15-0.85), during the ninth year after net implementation). During the tenth year of net implementation, no cases of malaria were observed among the study population. The use of nets increased significantly after the third time the nets were renewed when compared with the year after the first and the second times the nets were renewed ($P < 0.001$). The third renewal of nets, which took place after 2 years instead of 3 years together with a higher use of LLINs especially among the young, probably prevented the occurrence of a third malaria upsurge in this village.

30. Am J Trop Med Hyg. 2020 Nov 2.. Online ahead of print.

Assessing Village Health Workers' Ability to Perform and Interpret Rapid Diagnostic Tests for Malaria 4 Years after Initial Training: A Cross-Sectional Study

James S Miller et al, Harvard Medical School, Boston, Massachusetts.

Village health workers (VHWs) in Bugoye subcounty, Uganda, provide integrated community case management (iCCM) care to children younger than 5 years for malaria, pneumonia, and diarrhea. We assessed the longevity of VHWs' skills in performing and reading malaria rapid diagnostic tests (RDTs) 4 years after initial training, comparing VHWs who had completed initial iCCM training 1

year before the study with VHWs who had completed training 4 years before the study. Both groups received quarterly refresher trainings. Trained interviewers observed 36 VHWs reading six mock RDTs each and performing an RDT as part of a larger skills assessment exercise. Village health workers read 97% of mock RDTs correctly; of the 36 VHWs, 86% read all six mock RDTs correctly. Most VHWs scored either 12/13 or 13/13 on the RDT checklist (39% and 36%, respectively), with 25% scoring 11/13 or lower. For reading mock RDTs, VHWs in the first group (initial training 4 years before study) read 97% of mock RDTs correctly, whereas those in the second group (initial training 1 year before study) read 96% of mock RDTs correctly; the first group had a mean of 5.83 RDTs read correctly, compared with 5.77 RDTs read correctly in the second group (P = 0.82). For performing an RDT, the first group completed a mean of 12.0 steps correctly, compared with a mean of 12.2 correct steps in the second group (P = 0.66). Overall, VHWs demonstrated proficiency in reading RDTs accurately and performing RDTs according to protocol at least 4 years after initial iCCM training.

31. N Engl J Med 2020; 383 (No 24):2242-2254

Malaria Chemoprevention in the Postdischarge Management of Severe Anemia.

Titus K. Kwambai, et al. Address reprint requests to Dr. ter Kuile at the Liverpool School of Tropical Medicine, Pembroke Pl., Liverpool L3 5QA, United Kingdom, or at feiko.terkuile@lstmed.ac.uk.

BACKGROUND

Children who have been hospitalized with severe anemia in areas of Africa in which malaria is endemic have a high risk of readmission and death within 6 months after discharge. No prevention strategy specifically addresses this period.

METHODS

We conducted a multicenter, two-group, randomized, placebo-controlled trial in nine hospitals in Kenya and Uganda to determine whether 3 months of malaria chemoprevention could reduce morbidity and mortality after hospital discharge in children younger than 5 years of age who had been admitted with severe anemia. All children received standard in-hospital care for severe anemia and a 3-day course of artemether–lumefantrine at discharge. Two weeks after discharge, children were randomly assigned to receive dihydroartemisinin–piperaquine (chemoprevention group) or placebo, administered as 3-day courses at 2, 6, and 10 weeks after discharge. Children were followed for 26 weeks after discharge. The primary outcome was one or more hospital readmissions for any reason or death from the time of randomization to 6 months after discharge. Conditional risk-set modeling for recurrent events was used to calculate hazard ratios with the use of the Prentice–Williams–Peterson total-time approach.

RESULTS

From May 2016 through May 2018, a total of 1049 children underwent randomization; 524 were assigned to the chemoprevention group and 525 to the placebo group. From week 3 through week 26, a total of 184 events of readmission or death occurred in the chemoprevention group and 316 occurred in the placebo group (hazard ratio, 0.65; 95% confidence interval [CI], 0.54 to 0.78; P<0.001). The lower incidence of readmission or death in the chemoprevention group than in the placebo group was restricted to the intervention period (week 3 through week 14) (hazard ratio, 0.30; 95% CI, 0.22 to 0.42) and was not sustained after that time (week 15 through week 26) (hazard ratio, 1.13; 95% CI, 0.87 to 1.47). No serious adverse events were attributed to dihydroartemisinin–piperaquine.

CONCLUSIONS

In areas with intense malaria transmission, 3 months of postdischarge malaria chemoprevention with monthly dihydroartemisinin–piperaquine in children who had recently received treatment for severe anemia prevented more deaths or readmissions for any reason after discharge than placebo.

32. PLoS Med 17(9): e1003254. (2020)

Quality of clinical management of children diagnosed with malaria: A cross-sectional assessment in 9 sub-Saharan African countries between 2007–2018.

Cohen JL, et al. Affiliation Harvard T. H. Chan School of Public Health, Boston, Massachusetts, United States of America. Mail: cohenj@hsph.harvard.edu

Background

Appropriate clinical management of malaria in children is critical for preventing progression to severe disease and for reducing the continued high burden of malaria mortality. This study aimed to assess

the quality of care provided to children under 5 diagnosed with malaria across 9 sub-Saharan African countries.
Methods and findings
We used data from the Service Provision Assessment (SPA) survey. SPAs are nationally representative facility surveys capturing quality of sick-child care, facility readiness, and provider and patient characteristics. The data set contained 24,756 direct clinical observations of outpatient sick-child visits across 9 countries, including Uganda (2007), Rwanda (2007), Namibia (2009), Kenya (2010), Malawi (2013), Senegal (2013–2017), Ethiopia (2014), Tanzania (2015), and Democratic Republic of the Congo (2018). We assessed the proportion of children with a malaria diagnosis who received a blood test diagnosis and an appropriate antimalarial. We used multilevel logistic regression to assess facility and provider and patient characteristics associated with these outcomes. Subgroup analyses with the 2013–2018 country surveys only were conducted for all outcomes. Children observed were on average 20.5 months old and were most commonly diagnosed with respiratory infection (47.7%), malaria (29.7%), and/or gastrointestinal infection (19.7%). Among the 7,340 children with a malaria diagnosis, 32.5% (95% CI: 30.3%–34.7%) received both a blood-test–based diagnosis and an appropriate antimalarial. The proportion of children with a blood test diagnosis and an appropriate antimalarial ranged from 3.4% to 57.1% across countries. In the more recent surveys (2013–2018), 40.7% (95% CI: 37.7%–43.6%) of children with a malaria diagnosis received both a blood test diagnosis and appropriate antimalarial. Roughly 20% of children diagnosed with malaria received no antimalarial at all, and nearly 10% received oral artemisinin monotherapy, which is not recommended because of concerns regarding parasite resistance. Receipt of a blood test diagnosis and appropriate antimalarial was positively correlated with being seen at a facility with diagnostic equipment in stock (adjusted OR 3.67; 95% CI: 2.72–4.95) and, in the 2013–2018 subsample, with being seen at a facility with Artemisinin Combination Therapies (ACTs) in stock (adjusted OR 1.60; 95% CI:1.04–2.46). However, even if all children diagnosed with malaria were seen by a trained provider at a facility with diagnostics and medicines in stock, only a predicted 37.2% (95% CI: 34.2%–40.1%) would have received a blood test and appropriate antimalarial (44.4% for the 2013–2018 subsample). Study limitations include the lack of confirmed malaria test results for most survey years, the inability to distinguish between a diagnosis of uncomplicated or severe malaria, the absence of other relevant indicators of quality of care including dosing and examinations, and that only 9 countries were studied.
Conclusions
In this study, we found that a majority of children diagnosed with malaria across the 9 surveyed sub-Saharan African countries did not receive recommended care. Clinical management is positively correlated with the stocking of essential commodities and is somewhat improved in more recent years, but important quality gaps remain in the countries studied. Continued reductions in malaria mortality will require a bigger push toward quality improvements in clinical care.

33. PLoS Med 17(9): e1003318. (2020)

Clinical relevance of low-density Plasmodium falciparum parasitemia in untreated febrile children: A cohort study.
Hartley M-A, et al. Affiliations Centre for Primary Care and Public Health, University of Lausanne. Mail: Mary-Anne.Hartley@epfl.ch
Background
Low-density (LD) Plasmodium infections are missed by standard malaria rapid diagnostic tests (standard mRDT) when the blood antigen concentration is below the detection threshold. The clinical impact of these LD infections is unknown. This study investigates the clinical presentation and outcome of untreated febrile children with LD infections attending primary care facilities in a moderately endemic area of Tanzania.
Methods/findings
This cohort study includes 2,801 febrile pediatric outpatients (median age 13.5 months [range 2–59], female:male ratio 0.8:1.0) recruited in Dar es Salaam, Tanzania between 01 December 2014 and 28 February 2016. Treatment decisions were guided by a clinical decision support algorithm run on a mobile app, which also collected clinical data. Only standard mRDT+ cases received antimalarials. Outcomes (clinical failure, secondary hospitalization, and death) were collected in follow-up visits or

interviews on days 3, 7, and 28. After patient recruitment had ended, frozen blood from all 2,801 patients was tested for Plasmodium falciparum (Pf) by ultrasensitive–quantitative polymerase chain reaction (qPCR), standard mRDT, and "ultrasensitive" mRDT. As the latter did not improve sensitivity beyond standard mRDT, it is hereafter excluded. Clinical features and outcomes in LD patients (standard mRDT-/ultrasensitive-qPCR+, not given antimalarials) were compared with those with no detectable (ND) parasitemia (standard mRDT-/ultrasensitive-qPCR-) or high-density (HD) infections (standard mRDT+/ultrasensitive-qPCR+, antimalarial-treated).
Pf positivity rate was 7.1% (n = 199/2,801) and 9.8% (n = 274/2,801) by standard mRDT and ultrasensitive qPCR, respectively. Thus, 28.0% (n = 76/274) of ultrasensitive qPCR+ cases were not detected by standard mRDT and labeled "LD". LD patients were, on average, 10.6 months younger than those with HD infections (95% CI 7.0–14.3 months, p < 0.001). Compared with ND, LD patients more frequently had the diagnosis of undifferentiated fever of presumed viral origin (risk ratio [RR] = 2.0, 95% CI 1.3–3.1, p = 0.003) and were more often suffering from severe malnutrition (RR = 3.2, 95% CI 1.1–7.5, p = 0.03). Despite not receiving antimalarials, outcomes for the LD group did not differ from ND regarding clinical failures (2.6% [n = 2/76] versus 4.0% [n = 101/2,527], RR = 0.7, 95% CI 0.2–3.5, p = 0.7) or secondary hospitalizations (2.6% [n = 2/76] versus 2.8% [n = 72/2,527], RR = 0.7,95% CI 0.2–3.2, p = 0.9), and no deaths were reported in any Pf-positive groups. HD patients experienced more secondary hospitalizations (10.1% [n = 20/198], RR = 0.3, 95% CI 0.1–1.0, p = 0.005) than LD patients. All the patients in this cohort were febrile children; thus, the association between parasitemia and fever cannot be investigated, nor can the conclusions be extrapolated to neonates and adults.
Conclusions
During a 28-day follow-up period, we did not find evidence of a difference in negative outcomes between febrile children with untreated LD Pf parasitemia and those without Pf parasitemia. These findings suggest LD parasitemia may either be a self-resolving fever or an incidental finding in children with other infections, including those of viral origin. These findings do not support a clinical benefit nor additional risk (e.g. because of missed bacterial infections) to using ultrasensitive malaria diagnostics at a primary care level.

Mental health

34. Lancet 2020;369(10257):1045

Editorial
Mental health: time to invest in quality
The theme of this year's World Mental Health Day, on Oct 10, is increased investment in mental health. Why invest, and why now? The answer is simple. At the best of times, good mental health is needed for a society to thrive. During a pandemic, good mental health is more important than ever. Without a focus on mental health, any response to COVID-19 will be deficient, reducing individual and societal resilience, and impeding social, economic, and cultural recovery.
The precise neurological and psychiatric consequences of infection, meanwhile, remain unknown but demand careful monitoring. What investment is needed from governments and non-governmental organisations to mitigate the mental health impact of COVID-19 and, more importantly, to improve mental health globally?
The economic argument for investment in mental health services is clear and has been made many times, but there is also an ethical imperative for investment, both to redress historic wrongs done to vulnerable communities and to right current inequities. On a global scale, this strategy involves the empowerment of individuals and communities, the admission that high-income countries have much to learn from the innovations of low-income and middle-income settings, and the recognition of the central role of mental health in global health security now and in the future. Investment must be about more than just money if mental health services are to be made fit to address the challenges of the COVID-19 and post- COVID-19 era and to become resilient against future public health crises. There must be an investment of thought, time, and a commitment to change.

35. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7455253/pdf/main.pdf

Meta-Analysis Lancet Psychiatry 2020 Oct;7(10):851-864. doi: 10.1016/S2215-0366(20)30256-X. Epub 2020 Aug 28.

Effectiveness of digital psychological interventions for mental health problems in low-income and middle-income countries: a systematic review and meta-analysis

Zhongfang Fu et al

Faculty of Psychology, Beijing Normal University, Beijing, China; Department of Psychiatry, Amsterdam University Medical Center, Location AMC, University of Amsterdam, Amsterdam, Netherlands.

Abstract

Background: The effectiveness of digital psychological interventions in low-income and middle-income countries (LMICs) remains unclear. We aimed to systematically investigate the available evidence for digital psychological interventions in reducing mental health problems in LMICs.

Methods: In this systematic review and meta-analysis, we searched PubMed, PsycINFO, Embase, and Cochrane databases for articles published in English from database inception to March 9, 2020. We included randomised controlled trials investigating digital psychological interventions in individuals with mental health problems in LMICs. We extracted data on demographics, inclusion and exclusion criteria, details of the intervention, including the setting, digital delivery method, control group conditions, number of sessions, therapeutic orientation (eg, cognitive therapy or behaviour therapy), presence or absence of guidance, and length of follow-up, and statistical information to calculate effect sizes. If a study reported insufficient data to calculate effect sizes, the corresponding authors were contacted to provide data that could be aggregated. We did random-effects meta-analyses, and calculated the standardised mean difference in scores of digital psychological interventions versus control conditions (Hedges'g). Quality of evidence was assessed by use of the Grading of Recommendations Assessment, Development, and Evaluation approach. The primary outcome was post-intervention mental health problems, as measured by self-reporting instruments or clinical interviews. This study is registered with PROSPERO, CRD42019137755.

Findings: We identified 22 eligible studies that were included in the meta-analysis. The included studies involved a total of 4104 participants (2351 who received a digital psychological intervention and 1753 who were in the control group), and mainly focused on young adults (mean age of the study population was 20-35 years) with depression or substance misuse. The results showed that digital psychological interventions are moderately effective when compared with control interventions (Hedges'g 0·60 [95% CI 0·45-0·75]; Hedges'g with treatment as usual subgroup for comparison 0·54 [0·35-0·73]). Heterogeneity between studies was substantial (I2=74% [95% CI 60-83]). There was no evidence of publication bias, and the quality of evidence according to the GRADE criteria was generally high.

36. https://www.thelancet.com/pdfs/journals/landig/PIIS2589-7500(20)30252-1.pdf

Lancet Digit Health 2020 Nov;2(11):e571-e572. doi: 10.1016/S2589-7500(20)30252-1. Epub 2020 Oct 19.

Africa turns to telemedicine to close mental health gap

Paul Adepoju

Prior to the COVID-19 pandemic, mental health in Africa was a major concern with the continent underperforming on several key mental health metrics, including the numbers of hospital beds for patients with mental illness and coverage of outpatient facilities being lower than the global average. Crick Lund, Professor at the Alan J Flisher Centre for Public Mental Health (University of Cape Town, South Africa) notes that due to the numerous challenges that African countries are dealing with, including poverty, infant and maternal mortality, and infectious diseases, the importance of mental health had been overlooked. He adds that the state of mental health in Africa has also been compounded by factors including low awareness of mental health conditions, stigma, and the perception of mental health illnesses as untreatable. These issues not only affect the mental wellness of Africans, but also the practice of mental healthcare. Africa also has a mental healthcare expertise problem; most countries with the fewest mental health professionals per 100000 population are in Africa. Olatunde Ayinde, a Nigerian psychiatrist, tells The Lancet Digital Health that few doctors are choosing to specialise in psychiatry because of stigma associated with the specialty. “Not only are

clients stigmatised, even we who are psychiatrists are also stigmatised. There is that differential preference of medical graduates for specialties other than psychiatry," Ayinde says. On Oct 10, Africa joined the rest of the world in celebrating World Mental Health Day. As well as bringing attention to the state of mental wellness across the continent, this year it also drew attention to the impact of the COVID-19 pandemic. Aside from exacerbating mental illnesses among patients with a history of mental health conditions, the socioeconomic impacts of COVID-19 can also precipitate mental illnesses in individuals without any previous history. Unlike economies that were able to provide social safety nets for citizens during and beyond lockdown, Africans in most countries had to deal with the effects of the pandemic with little or no social support, putting them at risk of conditions including anxiety and depression. In May, 2020, the Africa Centres for Disease Control and Prevention issued guidance for mental health and psychosocial support during the COVID-19 pandemic. Similar to WHO guidance, it provides practical steps to reduce stress, anxiety, stigma, and psychological disorders associated with COVID-19 and improve overall mental health and wellbeing. But despite such guidance, the COVID-19 response measures introduced by many African countries largely excluded mental health provisions, even though need for them soon emerged.
Across Africa, mental health tech startups including Wazi in Kenya, PsyndUp in Nigeria, MindIT in Ghana, and the MEGA project in South Africa and Zambia are joining local and national associations of psychiatrists who are providing free virtual online mental health consultations, to provide easier and quicker access to mental health services.
"Most importantly for us, we want to make sure people have someone to talk to. With COVID-19 exacerbating mental health, we need to start integrating mental health into the conversation right from the start [because] in crisis situations, people are more likely to develop mental health problems."
Interpretation: Digital psychological interventions, which have been mostly studied in individuals with depression and substance misuse, are superior to control conditions, including usual care, and are moderately effective in LMICs. However, the considerable heterogeneity observed in our analysis highlights the need for more studies to be done, with standardised implementation of digital psychological intervention programmes to improve their reproducibility and efficiency. Digital psychological interventions should be considered for regions where usual care for mental health problems is minimal or absent.

Non communicable diseases

37. Lancet 2020; 396: 918–34

NCD Countdown 2030: pathways to achieving Sustainable Development Goal target 3.4
NCD Countdown 2030 collaborators <majid.ezzati@imperial.ac.uk>
The Sustainable Development Goal (SDG) target 3.4 is to reduce premature mortality from non-communicable diseases (NCDs) by a third by 2030 relative to 2015 levels, and to promote mental health and wellbeing. We used data on cause-specific mortality to characterise the risk and trends in NCD mortality in each country and evaluate combinations of reductions in NCD causes of death that can achieve SDG target 3.4. Among NCDs, ischaemic heart disease is responsible for the highest risk of premature death in more than half of all countries for women, and more than three-quarters for men. However, stroke, other cardiovascular diseases, and some cancers are associated with a similar risk, and in many countries, a higher risk of premature death than ischaemic heart disease. Although premature mortality from NCDs is declining in most countries, for most the pace of change is too slow to achieve SDG target 3.4. To investigate the options available to each country for achieving SDG target 3.4, we considered different scenarios, each representing a combination of fast (annual rate achieved by the tenth best performing percentile of all countries) and average (median of all countries) declines in risk of premature death from NCDs. Pathways analysis shows that every country has options for achieving SDG target 3.4. No country could achieve the target by addressing a single disease. In at least half the countries, achieving the target requires improvements in the rate of decline in at least five causes for women and in at least seven causes for men to the same rate achieved by the tenth best performing percentile of all countries. Tobacco and alcohol control and effective health-system interventions—including hypertension and diabetes treatment; primary and secondary cardiovascular disease prevention in high-risk individuals; low-dose inhaled corticosteroids and

bronchodilators for asthma and chronic obstructive pulmonary disease; treatment of acute cardiovascular diseases, diabetes complications, and exacerbations of asthma and chronic obstructive pulmonary disease; and effective cancer screening and treatment—will reduce NCD causes of death necessary to achieve SDG target 3.4 in most countries.
Key messages
• Achieving Sustainable Development Goal (SDG) target3.4—to reduce premature mortality from non-communicable diseases (NCDs) by a third by 2030 relative to 2015 levels—is ambitious but every country has one or more pathways to achieve the target by 2030.
• Globally, regionally, and nationally the risk of dying from various NCDs is marked by huge diversity in terms of magnitude and changes over time. No country could achieve the SDG target 3.4 by addressing a single disease. Pathways to SDG target 3.4 require accelerating reductions in several NCDs to the rates of decline achieved in the best performing 10% of all countries.
• Country-specificdecisionsonwhichinterventionsandactionscanaccelerateprogress towards the target are required. Essential components of strategies to achieve SDG target 3.4 in most countries include tobacco and alcohol control and effective health- system interventions. Scaling up these interventions requires an accessible and equitable health system, with a capacity for priority setting, and implementation of NCD care within the health system.

38. Lancet. 2020 Oct 31;396(10260):1443-1451.

Stroke systems of care in low-income and middle-income countries: challenges and opportunities
Jeyaraj D Pandian et al, Department of Neurology, Christian Medical College, Ludhiana, India. Electronic address: jeyarajpandian@hotmail.com.
The burden of stroke is higher in low-income and middle-income countries (LMICs) than in high-income countries and is rising. Even though there are global policies and guidelines for implementing stroke care, there are many challenges in setting up stroke services in LMICs. Despite these challenges, there are many models of stroke care available in LMICs-eg, multidisciplinary team care led by a stroke neurologist, specialist-led care by neurologists, physician-led care, hub and spoke models incorporating stroke telemedicine (ie, telestroke), and task sharing involving community health workers. Alternative strategies have been developed, such as reorganising the existing hospital infrastructure by training health professionals to implement protocol-driven care. The future challenge is to identify what elements of organised stroke care can be implemented to make the largest gain. Simple interventions such as swallowing assessments, bowel and bladder care, mobility assessments, and consistent secondary prevention can prove to be key elements to improving post-discharge morbidity and mortality in LMICs.

Sexual and reproductive health

39. Am J Trop Med Hyg. 2020 Dec 14. Online ahead of print.

Lung Ultrasound for Detection of Pulmonary Complications in Critically Ill Obstetric Patients in a Resource-Limited Setting
Luigi Pisani et al., Mahidol-Oxford Tropical Medicine Research Unit (MORU), Mahidol University, Bangkok, Thailand./ Department of Intensive Care, Amsterdam University Medical Centers-Location AMC, The Netherlands.
Critically ill parturients have an increased risk of developing pulmonary complications. Lung ultrasound (LUS) could be effective in addressing the cause of respiratory distress in resource-limited settings with high maternal mortality. We aimed to determine the frequency, timing of appearance, and type of pulmonary complications in critically ill parturients in an obstetric unit in Sierra Leone. In this prospective observational study, LUS examinations were performed on admission, after 24 and 48 hours, and in case of respiratory deterioration. Primary endpoint was the proportion of parturients with one or more pulmonary complications, stratified for the presence of respiratory distress. Secondary endpoints included timing and types of complications, and their association with "poor outcome," defined as a composite of transfer for escalation of care or death. Of 166 patients enrolled, 35 patients (21% [95% CI: 15-28]) had one or more pulmonary complications, the majority diagnosed on admission. Acute respiratory distress syndrome (period prevalence 4%) and hydrostatic pulmonary

edema (4%) were only observed in patients with respiratory distress. Pneumonia (2%), atelectasis (10%), and pleural effusion (7%) were present, irrespective of respiratory distress. When ultrasound excluded pulmonary complications, respiratory distress was related to anemia or metabolic acidosis. Pulmonary complications were associated with an increased risk of poor outcome (odds ratio: 5.0; 95% CI: 1.7-14.6; P = 0.003). In critically ill parturients in a resource-limited obstetric unit, LUS contributed to address the cause of respiratory distress by identifying or excluding pulmonary complications. These were associated with a poor outcome.

40. BMJ 2020;371:m3811 Research

Associations between high temperatures in pregnancy and risk of preterm birth, low birth weight, and stillbirths: systematic review and meta-analysis

Matthew Francis Chersichet al., Wits Reproductive Health and HIV Institute, Faculty of Health Sciences, University of the Witwatersrand, Hillbrow, Johannesburg 2001, South Africa
mchersich@wrhi.ac.za

Abstract

Objective To assess whether exposure to high temperatures in pregnancy is associated with increased risk for preterm birth, low birth weight, and stillbirth.

Design Systematic review and random effects meta-analysis.

Data sources Medline and Web of Science searched up to September 2018, updated in August 2019.

Eligibility criteria for selecting studies Clinical studies on associations between high environmental temperatures, and preterm birth, birth weight, and stillbirths.

Results 14 880 records and 175 full text articles were screened. 70 studies were included, set in 27 countries, seven of which were countries with low or middle income. In 40 of 47 studies, preterm births were more common at higher than lower temperatures. Exposures were classified as heatwaves, 1°C increments, and temperature threshold cutoff points. In random effects meta-analysis, odds of a preterm birth rose 1.05-fold (95% confidence interval 1.03 to 1.07) per 1°C increase in temperature and 1.16-fold (1.10 to 1.23) during heatwaves. Higher temperature was associated with reduced birth weight in 18 of 28 studies, with considerable statistical heterogeneity. Eight studies on stillbirths all showed associations between temperature and stillbirth, with stillbirths increasing 1.05-fold (1.01 to 1.08) per 1°C rise in temperature. Associations between temperature and outcomes were largest among women in lower socioeconomic groups and at age extremes. The multiple temperature metrics and lag analyses limited comparison between studies and settings.

Conclusions Although summary effect sizes are relatively small, heat exposures are common and the outcomes are important determinants of population health. Linkages between socioeconomic status and study outcomes suggest that risks might be largest in low and middle income countries. Temperature rises with global warming could have major implications for child health.

41. http://dx.doi.org/10.1136/bmjgh-2020-003370 Original research

Improving maternal, newborn and child health outcomes through a community-based women's health education program: a cluster randomised controlled trial in western Kenya

Lauren Y Maldonado et al., Medicine and Pediatrics, Massachusetts General Hospital, Boston, Massachusetts, USA

Abstract

Introduction Community-based women's health education groups may improve maternal, newborn and child health (MNCH); however, evidence from sub-Saharan Africa is lacking. Chamas for Change (Chamas) is a community health volunteer (CHV)-led, group-based health education programme for pregnant and postpartum women in western Kenya. We evaluated Chamas' effect on facility-based deliveries and other MNCH outcomes.

Methods We conducted a cluster randomised controlled trial involving 74 community health units in Trans Nzoia County. We included pregnant women who presented to health facilities for their first antenatal care visits by 32 weeks gestation. We randomised clusters 1:1 without stratification or matching; we masked data collectors, investigators and analysts to allocation. Intervention clusters were invited to bimonthly, group-based, CHV-led health lessons (Chamas); control clusters had monthly, individual CHV home visits (standard of care). The primary outcome was facility-based

delivery at 12-month follow-up. We conducted an intention-to-treat approach with multilevel logistic regression models using individual-level data.
Results Between 27 November 2017 and 8 March 2018, we enrolled 1920 participants from 37 intervention and 37 control clusters. A total of 1550 (80.7%) participants completed the study with 822 (82.5%) and 728 (78.8%) in the intervention and control arms, respectively. Facility-based deliveries improved in the intervention arm (80.9% vs 73.0%; risk difference (RD) 7.4%, 95% CI 3.0 to 12.5, OR=1.58, 95% CI 0.97 to 2.55, p=0.057). Chamas participants also demonstrated higher rates of 48 hours postpartum visits (RD 15.3%, 95% CI 12.0 to 19.6), exclusive breastfeeding (RD 11.9%, 95% CI 7.2 to 16.9), contraceptive adoption (RD 7.2%, 95% CI 2.6 to 12.9) and infant immunisation completion (RD 15.6%, 95% CI 11.5 to 20.9).
Conclusion Chamas participation was associated with significantly improved MNCH outcomes compared with the standard of care. This trial contributes robust data from sub-Saharan Africa to support community-based, women's health education groups for MNCH in resource-limited settings.

42. http://dx.doi.org/10.1136/bmjgh-2020-002965 Original research

The impact of implementing the 2016 WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience on perinatal deaths: an interrupted time-series analysis in Mpumalanga province, South Africa

Tina Lavin et al.,, School of Population and Global Health, The University of Western Australia Faculty of Medicine, Dentistry and Health Sciences, Perth, Western Australia, Australia

Abstract
Objectives: To investigate if the implementation of the 2016 WHO Recommendations for a Positive Pregnancy Experience reduced perinatal mortality in a South African province. The recommendations were implemented which included increasing the number of contacts and also the content of the contacts.
Methods: Retrospective interrupted time-series analysis was conducted for all women accessing a minimum of one antenatal care contact from April 2014 to September 2019 in Mpumalanga province, South Africa. Retrospective interrupted time-series analysis of province level perinatal mortality and birth data comparing the pre-implementation period (April 2014–March 2017) and post-implementation period (April 2018–September 2019). The main outcome measure was unadjusted prevalence ratio (PR) for perinatal deaths before and after implementation; interrupted time-series analyses for trends in perinatal mortality before and after implementation; stillbirth risk by gestational age; primary cause of deaths (and maternal condition) before and after implementation.
Results: Overall, there was a 5.8% absolute decrease in stillbirths after implementation of the recommendations, however this was not statistically significant (PR 0.95, 95% CI 0.90% to 1.05%; p=0.073). Fresh stillbirths decreased by 16.6% (PR 0.86, 95% CI 0.77% to 0.95%; p=0.003) while macerated stillbirths (p=0.899) and early neonatal deaths remained unchanged (p=0.499). When stratified by weight fresh stillbirths >2500 g decreased by 17.2% (PR 0.81, 95% CI 0.70% to 0.94%; p=0.007) and early neonatal deaths decreased by 12.8% (PR 0.88, 95% CI 0.77% to 0.99%; p=0.041). The interrupted time-series analysis confirmed a trend for decreasing stillbirths at 0.09/1000 births per month (−0.09, 95% CI −1.18 to 0.01; p=0.059), early neonatal deaths (−0.09, 95% CI −0.14 to 0.04; p=<0.001) and perinatal mortality (−1.18, 95% CI −0.27 to −0.09; p<0.001) in the post-implementation period. A decrease in stillbirths, early neonatal deaths or perinatal mortality was not observed in the pre-implementation period. During the period when additional antenatal care contacts were implemented (34–38 weeks), there was a decrease in stillbirths of 18.4% (risk ratio (RR) 0.82, 95% CI 0.73% to 0.91%, p=0.0003). In hypertensive disorders of pregnancy, the risk of stillbirth decreased in the post-period by 15.1% (RR 0.85; 95% CI 0.76% to 0.94%; p=0.002).
Conclusion :The implementation of the 2016 WHO Recommendations for a Positive Pregnancy Experience may be an effective public health strategy to reduce stillbirths in South African provinces.

TB

43. TMIH 2020;25(11):1308-27

National tuberculosis prevalence surveys in Africa, 2008-2016: an overview of results and lessons learned

Law I et al., Global Tuberculosis Programme, World Health Organization, Geneva, Switzerland

Objective and methods: Worldwide, tuberculosis (TB) is the leading cause of death from a single infectious agent. In many countries, national TB prevalence surveys are the only way to reliably measure the burden of TB disease and can also provide other evidence to inform national efforts to improve TB detection and treatment. Our objective was to synthesise the results and lessons learned from national surveys completed in Africa between 2008 and 2016, to complement a previous review for Asia.

Results: Twelve surveys completed in Africa were identified: Ethiopia (2010-2011), Gambia (2011-2013), Ghana (2013), Kenya (2015-2016), Malawi (2013-2014), Nigeria (2012), Rwanda (2012), Sudan (2013-2014), Tanzania (2011-2012), Uganda (2014-2015), Zambia (2013-2014) and Zimbabwe (2014). The eligible population in all surveys was people aged ≥15 years who met residency criteria. In total 588 105 individuals participated, equivalent to 82% (range 57-96%) of those eligible. The prevalence of bacteriologically confirmed pulmonary TB disease in those ≥15 years varied from 119 (95% CI 79-160) per 100 000 population in Rwanda and 638 (95% CI 502-774) per 100 000 population in Zambia. The male:female ratio was 2.0 overall, ranging from 1.2 (Ethiopia) to 4.1 (Uganda). Prevalence per 100 000 population generally increased with age, but the absolute number of cases was usually highest among those aged 35-44 years. Of identified TB cases, 44% (95% CI 40-49) did not report TB symptoms during screening and were only identified as eligible for diagnostic testing due to an abnormal chest X-ray. The overall ratio of prevalence to case notifications was 2.5 (95% CI 1.8-3.2) and was consistently higher for men than women. Many participants who did report TB symptoms had not sought care; those that had were more likely to seek care in a public health facility. HIV prevalence was systematically lower among prevalent cases than officially notified TB patients with an overall ratio of 0.5 (95% CI 0.3-0.7). The two main study limitations were that none of the surveys included people <15 years, and 5 of 12 surveys did not have data on HIV status.

Conclusions: National TB prevalence surveys implemented in Africa between 2010 and 2016 have contributed substantial new evidence about the burden of TB disease, its distribution by age and sex, and gaps in TB detection and treatment. Policies and practices to improve access to health services and reduce under-reporting of detected TB cases are needed, especially among men. All surveys provide a valuable baseline for future assessment of trends in TB disease burden.

44. TMIH 2020; Dec 1. doi: 10.1111/tmi.13533. Online ahead of print.

"I got tested at home, the help came to me": Acceptability and Feasibility of Home-based TB Testing of Household Contacts Using Portable Molecular Diagnostics in South Africa

Medina-Marino A et al., Research Unit, Foundation for Professional Development, East London, South Africa

Objective: The effectiveness of household contact investigations is limited by low referral uptake for clinic-based TB testing by symptomatic household contacts. We qualitatively investigated the acceptability and perceived benefits of home-based TB testing using a portable GeneXpert-I instrument (GX-I) in an urban South African township.

Methods: In-depth interviews were conducted with household contacts tested and those that observed testing. Semi-structured interviews explored household contact's understanding of TB, perceptions of the GX-I device and testing procedures, confidentiality, willingness to refer others, and views on home- versus clinic-based testing. Focus group discussions with home-based TB testing implementing staff assessed operational considerations for scale-up. Data were analysed using a constant comparison approach to qualitatively evaluate the acceptability and feasibility of home-based TB testing.

Results: Thirty in-depth interviews and two focus group discussions were conducted. Observing one's own sputum being tested resulted in an emergent trust in home-based TB testing, the GX-I device and one's test results. home-based TB testing was considered convenient, helped to overcome apathy towards testing and mitigated barriers to clinic-based testing. Perceptions that home-based TB testing contributes to improved household and community health resulted in an emergent theme of alleviation

of health insecurities. Operational concerns regarding inadvertent disclosure of one's diagnosis to household members and time spent in people's homes were identified.
Conclusions: Home-based TB testing was acceptable and feasible. Individuals expressed belief in the machine by being able to witness the testing process. Though most themes mirrored qualitative studies of home-based HIV testing, the alleviation of health insecurities theme is unique to home-based TB testing. Future research must evaluate the impact of home-based TB testing on case finding yield, time-to-treatment initiation, and household outcomes.

45. Am J Trop Med Hyg 2020 Nov;103(5):1827-1833.

Lung Ultrasound Findings Compared with Chest X-Ray Findings in Known Pulmonary Tuberculosis Patients: A Cross-Sectional Study in Lima, Peru
Matthew Fentress et al University of California, Davis, Sacramento, California
Lung ultrasound (LUS) is highly portable and has excellent diagnostic accuracy for pneumonia compared with conventional radiography, but the literature on its use in pulmonary tuberculosis (PTB) is limited. This study characterized LUS lesions in patients with PTB and compared them with chest X-ray (CXR) findings. Adult patients in Lima, Peru, with PTB were recruited within 1 week of starting antituberculosis treatment. Comprehensive LUS was performed in all patients at enrollment and assessed for consolidation, small subpleural consolidation (SPC, hypothesized to be a marker of CXR consolidation), cavity, pleural effusion, pathologic B-lines, and miliary pattern. Patient CXRs were digitized and interpreted by a board-certified radiologist. Fifty-one patients were included in the final analysis. Lung ultrasound detected either consolidation or SPC in 96.1% of participants. No significant difference was found between the LUS detection of a composite of consolidation or SPC, and CXR detection of consolidation (96.1% versus 98%, $P > 0.99$). The proportion of patients with cavity detected by LUS was significantly lower than that detected by CXR (5.9% versus 51%, $P < 0.001$). Overall, LUS detection of consolidation or SPC may be a sensitive marker for diagnosis of PTB. Lung ultrasound demonstrated poor ability to detect radiographically identified cavity, although previous studies suggest SPC could add specificity for the diagnosis of PTB. Based on its portability and evidence base for diagnosing other pulmonary diseases, LUS may have a role in screening and diagnosis of PTB in areas without ready access to CXR. Further studies should evaluate its diagnostic accuracy in patients with and without PTB.

46. Am J Trop Med Hyg. 2020 Dec 2. Online ahead of print.

COVID-19 and Tuberculosis-Related Catastrophic Costs
Ahmad Fuady, Tanja A J Houweling, Jan Hendrik Richardus
Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia / Department of Public Health, Erasmus MC, University Medical Center Rotterdam, Rotterdam, The Netherlands.
The COVID-19 pandemic has created an unprecedented health crisis and a substantial socioeconomic impact. It also affects tuberculosis (TB) control severely worldwide. Interruptions of many TB control programs because of the COVID-19 pandemic could result in significant setbacks. One of the targets that can be affected is the WHO's End TB Strategy goal to eliminate catastrophic costs of TB-affected households by 2030. Disruptions to TB programs and healthcare services due to COVID-19 could potentially prolong diagnostic delays and worsen TB treatment adherence and outcomes. The economic recession caused by the pandemic could significantly impact household financial capacity because of the reduction of income and the rise in unemployment rates. All of these factors increase the risk of TB incidence and the gravity of economic impact on TB-affected households, and hamper efforts to eliminate catastrophic costs and control TB. Therefore, efforts to eliminate the incidence of TB-affected households facing catastrophic costs will be very challenging. Because financial constraint plays a significant role in TB control, the improvement of health and social protection systems is critical. Even before the pandemic, many TB-high-burden countries (HBCs) lacked robust health and social protection systems. These challenges highlight the substantial need for a more robust engagement of patients and civil society organizations and international support in addressing the consequences of COVID-19 on the control of TB.

Miscellaneous

47. Lancet 2020;396(10255):877

Heidi Larson: shifting the conversation about vaccine confidence

Das, P.Heidi Larson, Professor of Anthropology, Risk and Decision Science at the Department of Infectious Disease Epidemiology at the UK's London School of Hygiene & Tropical Medicine (LSHTM), is the founder and Director of the Vaccine Confidence Project (VCP). A key research focus of the VCP is developing an early warning system to detect, monitor, and analyse waning public confidence in vaccines. Set up in 2010, the VCP also offers guidance for responding to such concerns and building public engagement to sustain confidence in vaccines and immunisation.

Larson's work has illuminated the complexity of vaccine hesitancy and challenged assumptions. Anti-vaxxers are one extreme but, she says, "I am more worried about the 80% or so who are in the middle and increasingly sceptical and doubtful about vaccines, partly fuelled by digital technology and excessive information at their fingertips. This questioning is a tipping point phenomenon. We have relied on the social contract for a very long time as we had a relatively agreeable public. But the challenge now is that these smaller pockets of dissent are all getting connected...That's where it is getting more problematic for the vaccine community, because these are deeper sentiments that are starting to affect other domains in life."

These ideas feature in Larson's new book, Stuck: How Vaccine Rumors Start—and Why They Don't Go Away. "It was inspired by a feeling that the conversation between the scientific/medical community and the public was 'stuck' between the scientists and health professionals inhibited about going into what feels to them to be messy, emotional, unscientific discussions, while publics...feel that scientists and medical professionals are elite, emotionless, and unwilling to listen to their genuine concerns, questions, and feeling", she says. Yet there is, Larson says, an opportunity for change: "Immunisation programmes that reach publics and individuals globally are a platform for outreach and engagement that official health authorities have not used as effectively as the dissenting and disrupting voices. This is an especially valuable opportunity with the new generation of scientists and medical professionals that are more digitally fluent and comfortable with new media to be able to use that global stage to challenge and engage with the public through social media, but it is also a time to engage vaccine champions beyond health circles."

At a time of increasing global uncertainty, Larson's values of respecting other people's views and engaging with them will be crucial. She plans to explore the emotional determinants of health in a Lancet–LSHTM Commission.

48. Am J Trop Med Hyg. 2020 Nov 23. Online ahead of print.

The Current State of Snakebite Care in Kenya, Uganda, and Zambia: Healthcare Workers' Perspectives and Knowledge, and Health Facilities' Treatment Capacity

Gaby I Oomset al. Health Action International, Amsterdam, The Netherlands /
Division of Pharmacoepidemiology and Clinical Pharmacology, Utrecht Centre for Pharmaceutical Policy and Regulation, (UIPS), The Netherlands. PMID: 33236717 DOI: 10.4269/ajtmh.20-1078

Snakebites continue to be a public health concern in sub-Saharan Africa, where availability of appropriate medical treatment is rare, even though death and disability can be prevented with timely intervention. A challenge is the lack of sociopolitical studies to inform health policies. This study aimed to identify snakebite patient profiles, healthcare workers' (HCWs) knowledge of snakebite, and facilities' snakebite treatment capacity in Kenya, Uganda, and Zambia to inform interventions to improve access to appropriate treatment. The research comprised a cross-sectional key informant survey among HCWs from health facilities in Kenya (n = 145), Uganda (n = 144), and Zambia (n = 108). Data were collected between March 2018 and November 2019. Most of the HCWs suggested that the number of snakebite incidents was similar between the genders, that most patients were aged 21-30 years, and most people were bitten when farming or walking. Overall, only 12% of HCWs had received formal training in snakebite management. Only about 20% of HCWs in each country said their health facility had the medicines needed to treat snakebites, with antivenom available in 0-34% of facilities across the sectors and countries, and snakebites were not systematically recorded. This

research shows that an integrative approach through policies to increase resource allocation for health system strengthening, including community education, HCW training, and improved access to snakebite treatment, is needed. Part of this approach should include regulations that ensure antivenoms available in health facilities meet quality control standards and that snakebites are accommodated into routine reporting systems to assess progress.