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34. Lancet. 2021 Mar 13;397(10278):1023-1034. Epub 2021 Feb 12.
Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment

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54. BMJ Global Health 2021;6:e004659. Original research
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TB

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Increasing tuberculosis burden in Latin America: an alarming trend for global control efforts

59. Emerg Infect Dis. 2021 Mar;27(3):805-812.
Effectiveness of Preventive Therapy for Persons Exposed at Home to Drug-Resistant Tuberculosis, Karachi, Pakistan

60. TMIH 2021;26(1):45-53
Prevalence and associated risk factors of drug-resistant tuberculosis in Thailand: results from the fifth national anti-tuberculosis drug resistance survey

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The hidden burden of eating disorders: an extension of estimates from the Global Burden of Disease Study 2019

INTERNATIONAL HEALTH ALERTS 2021-1 ABSTRACTS

Child Health

1. BMJ Global Health 2021;6:e003257. Original research

The role of governance in implementing sustainable global health interventions: review of health system integration for integrated community case management (iCCM) of childhood illnesses

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Improving health outcomes in countries with the greatest burden of under-5 child mortality requires implementing innovative approaches like integrated community case management (iCCM) to improve coverage and access for hard-to-reach populations. ICCM improves access for hard-to-reach populations by deploying community health workers to manage malaria, diarrhoea and pneumonia. Despite documented impact, challenges remain in programme implementation and sustainability. An analytical review was conducted using evidence from published and grey literature from 2010 to 2019. The goal was to understand the link between governance, policy development and programme sustainability for iCCM. A Governance Analytical Framework revealed thematic challenges and successes for iCCM adaptation to national health systems. Governance in iCCM included the collective problems, actors in coordination and policy-setting, contextual norms and programmatic interactions. Key challenges were country leadership, contextual evidence and information-sharing, dependence on external funding, and disease-specific stovepipes that impede funding and coordination. Countries that tailor and adapt programmes to suit their governance processes and meet their specific needs and capacities are better able to achieve sustainability and impact in iCCM.

2. BMJ Global Health 2021;6:e004996. Original research

Global and regional levels and trends of child and adolescent morbidity from 2000 to 2016: an analysis of years lost due to disability (YLDs)

Regina Guthold et al; Maternal, Newborn, Child and Adolescent Health and Ageing Department, WHO, Geneva, Switzerland gutholdr@who.int.

Introduction Non-fatal health loss makes a substantial contribution to the total disease burden among children and adolescents. An analysis of these morbidity patterns is essential to plan interventions that improve the health and well-being of children and adolescents. Our objective was to describe current levels and trends in the non-fatal disease burden from 2000 to 2016 among children and adolescents aged 0–19 years.
Methods We used years lost due to disability (YLD) estimates in WHO's Global Health Estimates to describe the non-fatal disease burden from 2000 to 2016 for the age groups 0–27 days, 28 days–11 months, 1–4 years, 5–9 years, 10–14 years and 15–19 years globally and by modified WHO region. To describe causes of YLDs, we used 18 broad cause groups and 54 specific cause categories.
Results In 2016, the total number of YLDs globally among those aged 0–19 years was about 130 million, or 51 per 1000 population, ranging from 30 among neonates aged 0–27 days to 67 among older adolescents aged 15–19 years. Global progress since 2000 in reducing the non-fatal disease burden has been limited (53 per 1000 in 2000 for children and adolescents aged 0–19 years). The most important causes of YLDs included iron-deficiency anaemia and skin diseases for both sexes, across age groups and regions. For young children under 5 years of age, congenital anomalies, protein–energy malnutrition and diarrhoeal diseases were important causes of YLDs, while childhood behavioural disorders, asthma, anxiety disorders and depressive disorders were important

causes for older children and adolescents. We found important variations between sexes and between regions, particularly among adolescents, that need to be addressed context-specifically. Conclusion The disappointingly slow progress in reducing the global non-fatal disease burden among children and adolescents contrasts starkly with the major reductions in mortality over the first 17 years of this century. More effective action is needed to reduce the non-fatal disease burden among children and adolescents, with interventions tailored for each age group, sex and world region.

3. Lancet. 2021 Mar 5;S0140-6736(21)00394-9. Online ahead of print.
Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda
Cesar G Victora et al., International Center for Equity in Health, Federal University of Pelotas, Pelotas, Brazil. cvictora@equidade.org

13 years after the first Lancet Series on maternal and child undernutrition, we reviewed the progress achieved on the basis of global estimates and new analyses of 50 low-income and middle-income countries with national surveys from around 2000 and 2015. The prevalence of childhood stunting has fallen, and linear growth faltering in early life has become less pronounced over time, markedly in middle-income countries but less so in low-income countries. Stunting and wasting remain public health problems in low-income countries, where 4·7% of children are simultaneously affected by both, a condition associated with a 4·8-times increase in mortality. New evidence shows that stunting and wasting might already be present at birth, and that the incidence of both conditions peaks in the first 6 months of life. Global low birthweight prevalence declined slowly at about 1·0% a year. Knowledge has accumulated on the short-term and long-term consequences of child undernutrition and on its adverse effect on adult human capital. Existing data on vitamin A deficiency among children suggest persisting high prevalence in Africa and south Asia. Zinc deficiency affects close to half of all children in the few countries with data. New evidence on the causes of poor growth points towards subclinical inflammation and environmental enteric dysfunction. Among women of reproductive age, the prevalence of low body-mass index has been reduced by half in middle-income countries, but trends in short stature prevalence are less evident. Both conditions are associated with poor outcomes for mothers and their children, whereas data on gestational weight gain are scarce. Data on the micronutrient status of women are conspicuously scarce, which constitutes an unacceptable data gap. Prevalence of anaemia in women remains high and unabated in many countries. Social inequalities are evident for many forms of undernutrition in women and children, suggesting a key role for poverty and low education, and reinforcing the need for multisectoral actions to accelerate progress. Despite little progress in some areas, maternal and child undernutrition remains a major global health concern, particularly as improvements since 2000 might be offset by the COVID-19 pandemic.

4. N Engl J Med 2020; 383:2514-2525
Antenatal Dexamethasone for Early Preterm Birth in Low-Resource Countries.
The WHO ACTION Trials Collaborators. Oladapo at the World Health Organisation oladapoo@who.int.

Background: The safety and efficacy of antenatal glucocorticoids in women in low-resource countries who are at risk for preterm birth are uncertain.
Methods: We conducted a multicountry, randomized trial involving pregnant women between 26 weeks 0 days and 33 weeks 6 days of gestation who were at risk for preterm birth. The participants were assigned to intramuscular dexamethasone or identical placebo. The primary outcomes were neonatal death alone, stillbirth or neonatal death, and possible maternal bacterial infection; neonatal death alone and stillbirth or neonatal death were evaluated with superiority analyses, and

possible maternal bacterial infection was evaluated with a noninferiority analysis with the use of a prespecified margin of 1.25 on the relative scale.
Results: A total of 2852 women (and their 3070 fetuses) from 29 secondary- and tertiary-level hospitals across Bangladesh, India, Kenya, Nigeria, and Pakistan underwent randomization. The trial was stopped for benefit at the second interim analysis. Neonatal death occurred in 278 of 1417 infants (19.6%) in the dexamethasone group and in 331 of 1406 infants (23.5%) in the placebo group (relative risk, 0.84; 95% confidence interval [CI], 0.72 to 0.97; P=0.03). Stillbirth or neonatal death occurred in 393 of 1532 fetuses and infants (25.7%) and in 444 of 1519 fetuses and infants (29.2%), respectively (relative risk, 0.88; 95% CI, 0.78 to 0.99; P=0.04); the incidence of possible maternal bacterial infection was 4.8% and 6.3%, respectively (relative risk, 0.76; 95% CI, 0.56 to 1.03). There was no significant between-group difference in the incidence of adverse events.
Conclusions: Among women in low-resource countries who were at risk for early preterm birth, the use of dexamethasone resulted in significantly lower risks of neonatal death alone and stillbirth or neonatal death than the use of placebo, without an increase in the incidence of possible maternal bacterial infection.

Communicable Diseases

5. Am J Trop Med Hyg. 2021 Feb 16. Online ahead of print.

Remote-Controlled and Pulse Pressure-Guided Fluid Treatment for Adult Patients with Viral Hemorrhagic Fevers
Marcus J Schultz et al., Mahidol Oxford Tropical Medicine Research Unit, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand.

Circulatory shock, caused by severe intravascular volume depletion resulting from gastrointestinal losses and profound capillary leak, is a common clinical feature of viral hemorrhagic fevers, including Ebola virus disease, Marburg hemorrhagic fever, and Lassa fever. These conditions are associated with high case fatality rates, and they carry a significant risk of infection for treating personnel. Optimized fluid therapy is the cornerstone of management of these diseases, but there are few data on the extent of fluid losses and the severity of the capillary leak in patients with VHFs, and no specific guidelines for fluid resuscitation and hemodynamic monitoring exist. We propose an innovative approach for monitoring VHF patients, in particular suited for low-resource settings, facilitating optimizing fluid therapy through remote-controlled and pulse pressure-guided fluid resuscitation. This strategy would increase the capacity for adequate supportive care, while decreasing the risk for virus transmission to health personnel.

6. Am J Trop Med Hyg. 2021 Mar 8. Online ahead of print.

Open Waste Canals as Potential Sources of Antimicrobial Resistance Genes in Aerosols in Urban Kanpur, India
Olivia Ginn et al., School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia.

Understanding the movement of antimicrobial resistance genes (ARGs) in the environment is critical to managing their spread. To assess potential ARG transport through the air via urban bioaerosols in cities with poor sanitation, we quantified ARGs and a mobile integron (MI) in ambient air over periods spanning rainy and dry seasons in Kanpur, India (n = 53), where open wastewater canals (OCWs) are prevalent. Gene targets represented major antibiotic groups-tetracyclines (tetA), fluoroquinolines (qnrB), and beta-lactams (blaTEM)-and a class 1 mobile integron (intI1). Over half of air samples located near, and up to 1 km from OCWs with fecal contamination (n = 45) in Kanpur had detectable targets above the experimentally determined limits of detection (LOD): most commonly

intI1 and tetA (56% and 51% of samples, respectively), followed by blaTEM (8.9%) and qnrB (0%). ARG and MI densities in these positive air samples ranged from 6.9 × 101 to 5.2 × 103 gene copies/m3 air. Most (7/8) control samples collected 1 km away from OCWs were negative for any targets. In comparing experimental samples with control samples, we found that intI1 and tetA densities in air are significantly higher (P = 0.04 and P = 0.01, respectively, alpha = 0.05) near laboratory-confirmed fecal contaminated waters than at the control site. These data suggest increased densities of ARGs and MIs in bioaerosols in urban environments with inadequate sanitation. In such settings, aerosols may play a role in the spread of AR.

7. BMJ 2021;372:m4931 Research

Association between human papillomavirus vaccination and serious adverse events in South Korean adolescent girls: nationwide cohort study

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Objective To evaluate the association between human papillomavirus (HPV) vaccination and serious adverse events in adolescent girls in South Korea.
Setting A large linked database created by linking the Korea Immunization Registry Information System and the National Health Information Database, between January 2017 and December 2019.
Participants 441 399 girls aged 11-14 years who had been vaccinated in 2017: 382 020 had been vaccinated against HPV and 59 379 had not been vaccinated against HPV.
Main outcome measures Outcomes were 33 serious adverse events, including endocrine, gastrointestinal, cardiovascular, musculoskeletal, haematological, dermatological, and neurological diseases. A cohort design was used for the primary analysis and a self-controlled risk interval design for the secondary analysis; both analyses used a risk period of one year after HPV vaccination for each outcome. Incidence rate and adjusted rate ratios were estimated using Poisson regression in the primary analysis, comparing the HPV vaccinated group with the HPV unvaccinated group, and adjusted relative risks were estimated using conditional logistic regression in the secondary analysis.
Results Among the 33 predefined serious adverse events, no associations were found with HPV vaccination in the cohort analysis, including Hashimoto's thyroiditis (incidence rate per 100 000 person years: 52.7 v 36.3 for the vaccinated and unvaccinated groups; adjusted rate ratio 1.24, 95% confidence interval 0.78 to 1.94) and rheumatoid arthritis (incidence rate per 100 000 person years: 168.1 v 145.4 for the vaccinated and unvaccinated groups; 0.99, 0.79 to 1.25), with the exception of an increased risk observed for migraine (incidence rate per 100 000 person years: 1235.0 v 920.9 for the vaccinated and unvaccinated groups; 1.11, 1.02 to 1.22). Secondary analysis using self-controlled risk intervals confirmed no associations between HPV vaccination and serious adverse events, including migraine (adjusted relative risk 0.67, 95% confidence interval 0.58 to 0.78). Results were robust to varying follow-up periods and for vaccine subtypes.
Conclusions In this nationwide cohort study, with more than 500 000 doses of HPV vaccines, no evidence was found to support an association between HPV vaccination and serious adverse events using both cohort analysis and self-controlled risk interval analysis. Inconsistent findings for migraine should be interpreted with caution considering its pathophysiology and the population of interest.

8. BMJ 2021;372:n373 Editorials

Developing vaccines for neglected and emerging infectious diseases

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Successful development of covid-19 vaccines can provide a blueprint

The rapid development of safe, high efficacy covid-19 vaccines in under a year is one of the greatest scientific achievements in recent history. It has sparked optimism that a vaccine revolution is under

way. The success of the covid-19 vaccine enterprise may be transferable to emerging infections and some neglected diseases such as tuberculosis (TB) if the protective antigens are known.
Covid-19 vaccine development has been a spectacular validation of next generation vaccine platforms. Most vaccines for other diseases were developed using established platforms such as whole inactivated virus (polio vaccine) or live attenuated virus (yellow fever vaccine). By contrast, the covid-19 vaccines with the fastest timelines to phase III efficacy results have used new technologies "best suited for speed"—mRNA and viral vectors. Decades of research went into creating these novel platforms. A recombinant protein approach has also been remarkably fast.
Even before the covid-19 pandemic, vaccine companies had started exploring the use of these new technologies for other diseases. Companies are now developing covid-19 mRNA vaccines that help overcome delivery challenges by being thermostable, single dose, or delivered nasally—features that could be valuable in vaccines for other diseases. And since the same production facility can be used to make RNA for different diseases, this should simplify manufacturing. Nevertheless, the chances of success against diseases such as HIV, malaria, and TB are unclear, partly because of the ways in which these pathogens can foil the immune system.
A relatively modest increase in funding could reap large rewards for global health. One modelling study found that even an additional $1bn in annual funding for development of vaccines for neglected diseases could greatly increase the odds of launching vaccines against malaria, hepatitis C, and diarrhoeal diseases.

9. Lancet 2021;397(0269):84-85
World Report Polio in Afghanistan: a changing landscape
Cousins S

In 1988, the World Health Assembly adopted a resolution for the worldwide eradication of polio, which at the time caused more than 350 000 cases in more than 125 endemic countries. Since the Global Polio Eradication Initiative was set up, the global incidence of polio has decreased by 99·9%, with an estimated 16 million people walking today who would otherwise have been paralysed and more than 1·5 million are alive who would otherwise not be.
Africa was declared free of wild poliovirus in August, 2020. Today, the virus remains endemic in just two countries: Afghanistan and Pakistan. But there is a growing realisation of the devastating effect the COVID-19 pandemic could have on global efforts to eradicate the disease.
Polio vaccination campaigns in Afghanistan were halted in March, 2020, for several months as the country went into lockdown. When the campaign resumed in August, for many children it was too late. Mohammed Mohammedi, UNICEF'S chief of immunisation for the polio programme, said that the decision to halt vaccinations was "a precautionary measure".
In 2020, 56 polio cases were reported in Afghanistan; in 2019 the figure was 29. Although the figure might appear low, it is the highest number on record for years. The disease is predominantly still found in southern parts of the country where vaccination programmes are difficult, if not impossible, to conduct because of ongoing conflict. But what concerns experts most is the spread of the virus to areas that had previously not recorded any cases for years. COVID-19 has altered the polio landscape. UNICEF estimates that 50 million children in Afghanistan and Pakistan missed out on vaccines in 2020 because of the disruption in immunisation due to the pandemic.
Rumours about vaccines have plagued Afghanistan and Pakistan for years since the US Central Intelligence Agency organised a fake hepatitis B vaccination programme in the Pakistani town where the organisation believed that Osama bin Laden was hiding. Health workers carrying out vaccinations in both countries have been repeatedly targeted for their work, accused of spying, and killed on numerous occasions.

10. PLoS Med 18(3): e1003550.
Global burden of influenza-associated lower respiratory tract infections and hospitalizations among adults: A systematic review and meta-analysis.
Lafond KE, et al., Influenza Division, US Centers for Disease Control and Prevention, Atlanta, USA
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Background: Influenza illness burden is substantial, particularly among young children, older adults, and those with underlying conditions. Initiatives are underway to develop better global estimates for influenza-associated hospitalizations and deaths. Knowledge gaps remain regarding the role of influenza viruses in severe respiratory disease and hospitalizations among adults, particularly in lower-income settings.
Methods and findings: We aggregated published data from a systematic review and unpublished data from surveillance platforms to generate global meta-analytic estimates for the proportion of acute respiratory hospitalizations associated with influenza viruses among adults. We searched 9 online databases (Medline, Embase, CINAHL, Cochrane Library, Scopus, Global Health, LILACS, WHOLIS, and CNKI; 1 January 1996–31 December 2016) to identify observational studies of influenza-associated hospitalizations in adults, and assessed eligible papers for bias using a simplified Newcastle–Ottawa scale for observational data. We applied meta-analytic proportions to global estimates of lower respiratory infections (LRIs) and hospitalizations from the Global Burden of Disease study in adults ≥20 years and by age groups (20–64 years and ≥65 years) to obtain the number of influenza-associated LRI episodes and hospitalizations for 2016. Data from 63 sources showed that influenza was associated with 14.1% (95% CI 12.1%–16.5%) of acute respiratory hospitalizations among all adults, with no significant differences by age group. The 63 data sources represent published observational studies (n = 28) and unpublished surveillance data (n = 35), from all World Health Organization regions (Africa, n = 8; Americas, n = 11; Eastern Mediterranean, n = 7; Europe, n = 8; Southeast Asia, n = 11; Western Pacific, n = 18). Data quality for published data sources was predominantly moderate or high (75%, n = 56/75). We estimate 32,126,000 (95% CI 20,484,000–46,129,000) influenza-associated LRI episodes and 5,678,000 (95% CI 3,205,000–9,432,000) LRI hospitalizations occur each year among adults. While adults <65 years contribute most influenza-associated LRI hospitalizations and episodes (3,464,000 [95% CI 1,885,000–5,978,000] LRI hospitalizations and 31,087,000 [95% CI 19,987,000–44,444,000] LRI episodes), hospitalization rates were highest in those ≥65 years (437/100,000 person-years [95% CI 265–612/100,000 person-years]). For this analysis, published articles were limited in their inclusion of stratified testing data by year and age group. Lack of information regarding influenza vaccination of the study population was also a limitation across both types of data sources.
Conclusions: In this meta-analysis, we estimated that influenza viruses are associated with over 5 million hospitalizations worldwide per year. Inclusion of both published and unpublished findings allowed for increased power to generate stratified estimates, and improved representation from lower-income countries. Together, the available data demonstrate the importance of influenza viruses as a cause of severe disease and hospitalizations in younger and older adults worldwide.

Conflict

11. Lancet 2021;397(10273):511-554
Series: Women's and Children's Health in Conflict Settings

This four-part Series is directed at the special requirements of providing sexual, reproductive, maternal, infant, child, and adolescent health and nutrition services in areas affected by armed conflict. In this Series, the term women's and children's health (WCH) is used to represent these areas of concern and service. More than half of the world's population of women and children are

living in countries experiencing armed conflict, and all but one of the ten countries with the highest neonatal mortality rates in the world are in conflict. Approximately 71 million people were forcibly displaced in 2019, most remaining in their countries as internally displaced people. Women and girls represent approximately half, and children approximately 40%, of all internally displaced people, and sexual violence against women in conflict settings is extremely high. During 2018, the UN verified more than 24 000 grave violations against children in 20 countries, including recruitment of child soldiers, killing or maiming, and sexual assault or abduction. The special health requirements of women, children, and adolescents in conflict settings have been outlined in previous reports and are addressed in detail in the other papers in this Series. Others have cogently articulated the broader humanitarian challenges generated by conflict.

The goal of this Series is to build on these contributions by providing greater analytic and empirical insight into the nature and dynamics of WCH in diverse conflict contexts. Although the Series uses various technical and case-study methodologies, its central intent is inherently applied and directed explicitly to providing pragmatic guidance for all actors confronting the evolving challenges of WCH service delivery in politically unstable and insecure settings. In the second paper of this Series, Bendavid and colleagues estimate the impact of conflict on a broad array of non-violent outcomes for women and children in different parts of the world. In the third paper of this Series, Singh and colleagues present detailed, contextual insights from ten case studies emphasising the varied challenges and requisite creativity associated with the provision of WCH services in different conflict environments. Gaffey and colleagues, in the fourth paper of the Series, suggest ways to prioritise recommended WCH interventions for different conflict settings and, in a linked Comment to the Series, Bhutta and colleagues propose an ambitious way forward for promoting WCH in areas of conflict. These recommendations extend current guidelines by recognising at once the need for a greater consensus on the technical elements of WCH strategies and better tools for adapting this technical consensus to a diverse and dynamic conflict environment. It also advocates for a more robust commitment to providing the requisite resources and a purposeful strengthening of coordination and governance in areas of greatest need.

12. Lancet 2021;397(10273):511-21
The political and security dimensions of the humanitarian health response to violent conflict
Wise PH et al.

13. 1Lancet 2021;397(10273):522-32
The effects of armed conflict on the health of women and children
Bendavid E et al.

14. Lancet 2021;397(10273):533-42
Delivering health interventions to women, children, and adolescents in conflict settings: what have we learned from ten country case studies?
Singh NS et al.

15. Lancet 2021;397(10273):543-54
Delivering health and nutrition interventions for women and children in different conflict contexts: a framework for decision making on what, when, and how
Gaffey MF et al.

COVID-19

16. Am J Trop Med Hyg. 2020 Dec 30;104(2):453-456.
COVID-19 Misinformation and Infodemic in Rural Africa
Melody Okereke et al., Faculty of Pharmaceutical Sciences, University of Ilorin, Ilorin, Nigeria.
The world has witnessed rapid advancement and changes since the COVID-19 pandemic emerged in Wuhan, China. The significant changes experienced during these times remain unprecedented. The African continent has initiated significant responses to curb the spread of the pandemic. However, there is an increasing concern that rural Africa is facing serious challenges in their responses to the COVID-19 pandemic. This is due to the uncertainty if the populations are detached from or in synch with information on COVID-19. The findings reported here suggest that rural Africa is burdened with misinformation and infodemic regarding COVID-19 due to widespread misconceptions and anecdotal reports. It is, therefore, necessary to engage with community leaders to provide awareness campaigns in rural communities to ensure access to reliable information issued by local and international health authorities. It is pertinent to set up avenues that improve health literacy in communities in rural Africa as it is a major determinant of information assimilation.

17. Am J Trop Med Hyg. 2021 Jan;104(1):91-94.
SARS-CoV-2 Seropositivity in Asymptomatic Frontline Health Workers in Ibadan, Nigeria
Olatunde Olayanju et al., Chemical Pathology Department, University College Hospital, Ibadan, Nigeria.

Global health has been thrown into turmoil by the COVID-19 pandemic, which has caused devastating morbidity and unprecedented loss of life in almost all continents of the world. It was predicted that the magnitude of the pandemic in Africa will be high because of poor health structure and intensely poor living condition, but that has not happened, surprisingly. It was hypothesized that the youthful population and a vastly primed immune system were protective, and many people may have been exposed without coming down with the severe disease. Most of them would have presented in hospitals with other medical conditions and possibly transmit COVID-19 to health workers inadvertently. This study is designed to measure serum SARS-CoV-2 IgG levels in health workers as a marker of latent exposure. Asymptomatic frontline health workers were randomly selected from the University College Hospital Ibadan, Nigeria; venous blood samples were obtained from them, and the serum SARS-CoV-2 IgG level was determined using ELISA techniques. A proportion of participants with seropositivity were obtained, and factors associated with seropositivity were determined. A total of 133 participants were recruited for this study, and 60 (45.1%) of them were seropositive for SARS-CoV-2. Among the seropositive participants were doctors, nurses, health assistants, laboratory scientists and technicians, and nonmedical staff. Obstetrics, gynecology, and emergency departments had higher odds of seropositivity. Seroprevalence of SARS-CoV-2 is very high among frontline health workers, though asymptomatic. This calls for a more stringent precaution against further spread within the hospital environment.

18. Am J Trop Med Hyg. 2021 Jan 13;104(3 Suppl):1-2. Online ahead of print.
Recommendations for the Management of COVID-19 in Low- and Middle-Income Countries
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To address the need for guidance on severe COVID-19 management in resource-limited settings, a COVID–LMIC Task Force was formed, comprising doctors and nurses with experience in critical care in LMICs. These members are either based in LMICs or have worked there extensively out of their home institutions in HICs. The group reviewed the current literature on a wide range of aspects of the management of severe COVID-19, focusing on evidence generated in the target countries. From

this review, and supplemented with local expert experience, the group formulated an evidence-informed set of pragmatic recommendations targeting the LMIC bedside practitioner. This led to a set of 10 articles presented as a supplement to the AJTMH. It is recognized that these recommendations are time-sensitive. Every month, more than 10,000 journal articles on COVID-19 are published, and new evidence can be expected to necessitate modification in the provided guidance. There are also additional sources of information on this topic. The WHO actively engages with doctors globally to discuss severe COVID-19 case management through their "COVID-19 Clinical Management and Characterization Working Group" (https://www.who.int/teams/health-care-readiness-clinical-unit/covid-19). Other professional groups, such as the Surviving Sepsis Campaign,6 have issued adapted guidelines. The new supplement offers a more comprehensive approach, discussing a wide variety of relevant topics. We hope that the articles will provide important practical guidance for the many doctors, nurses, and other frontline healthcare workers caring for patients with severe COVID-19 in LMICs. They are heroes.

Other Titles in this supplement Pragmatic Recommendations for the Management of COVID-19 in Low- and Middle-Income Countries. COVID-LMIC TASK FORCE

19. Pragmatic Recommendations for the Management of Acute Respiratory Failure and Mechanical Ventilation in Patients with COVID-19 in Low- and Middle-Income Countries

20. Pragmatic Recommendations for Tracheostomy, Discharge, and Rehabilitation Measures in Hospitalized Patients Recovering From Severe COVID-19 in Low- and Middle-Income Countries

21. Pragmatic Recommendations for the Use of Diagnostic Testing and Prognostic Models in Hospitalized Patients with Severe COVID-19 in Low- and Middle-Income Countries

22. Pragmatic Recommendations for the Prevention and Treatment of Acute Kidney Injury in Patients with COVID-19 in Low- and Middle-Income Countries

23. Pragmatic Recommendations for the Management of Anticoagulation and Venous Thrombotic Disease for Hospitalized Patients with COVID-19 in Low- and Middle-Income Countries

24. Pragmatic Recommendations for Therapeutics of Hospitalized COVID-19 Patients in Low- and Middle-Income Countries

25. Pragmatic Recommendations for the Management of COVID-19 Patients with Shock in Low- and Middle-Income Countries

26. Am J Trop Med Hyg. 2021 Feb 11. Online ahead of print.
Contact Tracing and the COVID-19 Response in Africa: Best Practices, Key Challenges, and Lessons Learned from Nigeria, Rwanda, South Africa, and Uganda
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Most African countries have recorded relatively lower COVID-19 burdens than Western countries. This has been attributed to early and strong political commitment and robust implementation of public health measures, such as nationwide lockdowns, travel restrictions, face mask wearing, testing, contact tracing, and isolation, along with community education and engagement. Other factors include the younger population age strata and hypothesized but yet-to-be confirmed partially protective cross-immunity from parasitic diseases and/or other circulating coronaviruses. However, the true burden may also be underestimated due to operational and resource issues for

COVID-19 case identification and reporting. In this perspective article, we discuss selected best practices and challenges with COVID-19 contact tracing in Nigeria, Rwanda, South Africa, and Uganda. Best practices from these country case studies include sustained, multi-platform public communications; leveraging of technology innovations; applied public health expertise; deployment of community health workers; and robust community engagement. Challenges include an overwhelming workload of contact tracing and case detection for healthcare workers, misinformation and stigma, and poorly sustained adherence to isolation and quarantine. Important lessons learned include the need for decentralization of contact tracing to the lowest geographic levels of surveillance, rigorous use of data and technology to improve decision-making, and sustainment of both community sensitization and political commitment. Further research is needed to understand the role and importance of contact tracing in controlling community transmission dynamics in African countries, including among children. Also, implementation science will be critically needed to evaluate innovative, accessible, and cost-effective digital solutions to accommodate the contact tracing workload.

27. Am J Trop Med Hyg. 2021 Mar 11. Online ahead of print.

Awake Proning as an Adjunctive Therapy for Refractory Hypoxemia in Non-Intubated Patients with COVID-19 Acute Respiratory Failure: Guidance from an International Group of Healthcare Workers Willemke Stilma et al., Department of Intensive Care, Amsterdam University Medical Centers, The Netherlands.

Non-intubated patients with acute respiratory failure due to COVID-19 could benefit from awake proning. Awake proning is an attractive intervention in settings with limited resources, as it comes with no additional costs. However, awake proning remains poorly used probably because of unfamiliarity and uncertainties regarding potential benefits and practical application. To summarize evidence for benefit and to develop a set of pragmatic recommendations for awake proning in patients with COVID-19 pneumonia, focusing on settings where resources are limited, international healthcare professionals from high and low- and middle-income countries (LMICs) with known expertise in awake proning were invited to contribute expert advice. A growing number of observational studies describe the effects of awake proning in patients with COVID-19 pneumonia in whom hypoxemia is refractory to simple measures of supplementary oxygen. Awake proning improves oxygenation in most patients, usually within minutes, and reduces dyspnea and work of breathing. The effects are maintained for up to 1 hour after turning back to supine, and mostly disappear after 6-12 hours. In available studies, awake proning was not associated with a reduction in the rate of intubation for invasive ventilation. Awake proning comes with little complications if properly implemented and monitored. Pragmatic recommendations including indications and contraindications were formulated and adjusted for resource-limited settings. Awake proning, an adjunctive treatment for hypoxemia refractory to supplemental oxygen, seems safe in non-intubated patients with COVID-19 acute respiratory failure. We provide pragmatic recommendations including indications and contraindications for the use of awake proning in LMICs.

28. BMJ 2021;372:m4853 Analysis

Covax must go beyond proportional allocation of covid vaccines to ensure fair and equitable access Lisa M Herzog, et al., Faculty of Philosophy, Oude Boteringestraat 52, University of Groningen, 9712 GL Groningen, Netherlands. Correspondence to: L Herzog l.m.herzog@rug.nl.

International collaboration is key for the fair and efficient distribution of covid-19 vaccines. Lisa Herzog and colleagues' Fair Priority Model, with its focus on allocating vaccine based on limiting covid-19 harms, realises ethical principles better than Covax's proposal of proportional allocation based on population

The Covax Facility (Covax) is a multilateral initiative aimed at ensuring that all countries have "fair and equitable access" to covid-19 vaccines. Co-led by Gavi, the Vaccine Alliance (Gavi), the Coalition for Epidemic Preparedness Innovations (CEPI), and the World Health Organization (WHO), Covax is a voluntary arrangement that enables countries to pool their resources and risk by collectively investing in vaccine candidates while developing the political and logistical infrastructure needed for vaccine distribution. Most importantly, Covax ensures that vaccines financed through the initiative will be allocated in a transparent and coordinated manner.

In September 2020, WHO delineated its plan for allocating vaccines through Covax. Under the plan, vaccine doses would initially be allocated to participating countries in proportion to their population size. Only after each country receives vaccine doses for 20% of its population would countries' covid risk profiles be considered in a subsequent phase of vaccine distribution. Countries participating in Covax are permitted to pursue bilateral contracts with vaccine manufacturers like the one between the UK and Pfizer-BioNTech. Many countries, high income and even low-middle income countries, such as Indonesia and Vietnam, have secured vaccine through bilateral agreements.

Proportional allocation of vaccines through Covax is fairer and more efficient than an uncoordinated approach in which countries compete in the market to secure as much vaccine as possible for their own citizens. But proportional allocation fails to meet WHO's own ethical principles for vaccine allocation. An alternative approach to vaccine allocation, which we call the Fair Priority Model, would be better aligned with WHO's stated values and better suited to realising Covax's promise of fair and equitable access to covid-19 vaccines.

The Fair Priority Model

Based on three widely shared ethical values—benefitting people and limiting harm, prioritising those who are disadvantaged, and equal moral concern—the Fair Priority Model allocates vaccines between countries in three phases. Phase 1 aims at minimising premature deaths, based on the reduction of standard expected years of life lost (SEYLL) averted per dose. Phase 2 adds socioeconomic factors, measured in SEYLL, loss of gross national income (GNI), and reduction of the poverty gap. Phase 3 aims at returning countries to their pre-covid-19 situation.

29. BMJ 2021;372:n303 Editorials

What went wrong in the global governance of covid-19?

Clare Wenham, assistant professor of global health policy C.Wenham@lse.ac.uk.

Plenty, according to the latest independent panel report

The mandate of the Independent Panel for Pandemic Preparedness and Response is to "provide an evidence-based path for the future, grounded in lessons of the present and the past to ensure countries and global institutions, including specifically WHO, effectively address health threats." These lessons are starting to emerge with the publication of the panel's second progress report. Unsurprisingly, the report touches several key problems in the global governance of covid-19: WHO's position, structure, and lack of financing; excessive focus on metrics to the detriment of political analysis; a lack of coordinated and sufficient financing for pandemic preparedness and response; global vaccine inequities; and the role of the broader global health architecture.

Almost every section of the report points to the extent to which politics has driven the trajectory of the pandemic in different locations—establishing that the policies chosen by governments reflect deeper political agendas and that the tension between the economy and public heath is a false dichotomy. Those governments willing to take the political and economic hit of harsh restrictions early in 2020 are now benefiting from freedom from population restrictions, and in the case of South Korea and China, flourishing economies.

Trying to appease both public health demands and the libertarian views of the free market has led not only to astronomical death tolls, such as in the US, UK, and Brazil, but to flailing economies. Halfway compromises do not work in response to pandemics and have just dragged out the

pandemic for all. Frustratingly, for those of us who research the politics of global health security, this was entirely foreseen.
The panel's suggestion that protocols within the International Health Regulations (IHR)—WHO's legal framework for preventing, detecting, and responding to emerging pathogens—are from an analogue era and need to be digitalised are misconstrued. It was through digital systems such as HealthMap, ProMED-Mail, and WHO's Global Outbreak and Alert Response Network that the world first came to know about Ebola, Zika, and SARS-CoV-2. All these mechanisms are permitted under article 9 of the IHR.

30. BMJ 2021;372:n334 Research

Covid-19 deaths in Africa: prospective systematic postmortem surveillance study
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Objective To directly measure the fatal impact of coronavirus disease 2019 (covid-19) in an urban African population.
Design Prospective systematic postmortem surveillance study.
Setting Zambia's largest tertiary care referral hospital.
Participants Deceased people of all ages at the University Teaching Hospital morgue in Lusaka, Zambia, enrolled within 48 hours of death.
Main outcome measure Postmortem nasopharyngeal swabs were tested via reverse transcriptase quantitative polymerase chain reaction (PCR) against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Deaths were stratified by covis-19 status, location, age, sex, and underlying risk factors.
Results 372 participants were enrolled between June and September 2020; PCR results were available for 364 (97.8%). SARS-CoV-2 was detected in 58/364 (15.9%) according to the recommended cycle threshold value of <40 and in 70/364 (19.2%) when expanded to any level of PCR detection. The median age at death among people with a positive test for SARS-CoV-2 was 48 (interquartile range 36-72) years, and 69% (n=48) were male. Most deaths in people with covid-19 (51/70; 73%) occurred in the community; none had been tested for SARS-CoV-2 before death. Among the 19/70 people who died in hospital, six were tested before death. Among the 52/70 people with data on symptoms, 44/52 had typical symptoms of covid-19 (cough, fever, shortness of breath), of whom only five were tested before death. Covid-19 was identified in seven children, only one of whom had been tested before death. The proportion of deaths with covid-19 increased with age, but 76% (n=53) of people who died were aged under 60 years. The five most common comorbidities among people who died with covid-19 were tuberculosis (22; 31%), hypertension (19; 27%), HIV/AIDS (16; 23%), alcohol misuse (12; 17%), and diabetes (9; 13%).
Conclusions Contrary to expectations, deaths with covid-19 were common in Lusaka. Most occurred in the community, where testing capacity is lacking. However, few people who died at facilities were tested, despite presenting with typical symptoms of covid-19. Therefore, cases of covid-19 were under-reported because testing was rarely done not because covid-19 was rare. If these data are generalizable, the impact of covid-19 in Africa has been vastly underestimated.

31. BMJ Global Health 2021;6:e004347. Original research

Small and sick newborn care during the COVID-19 pandemic: global survey and thematic analysis of healthcare providers' voices and experiences.
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Introduction The COVID-19 pandemic is disrupting health systems globally. Maternity care disruptions have been surveyed, but not those related to vulnerable small newborns. We aimed to

survey reported disruptions to small and sick newborn care worldwide and undertake thematic analysis of healthcare providers' experiences and proposed mitigation strategies.
Methods Using a widely disseminated online survey in three languages, we reached out to neonatal healthcare providers. We collected data on COVID-19 preparedness, effects on health personnel and on newborn care services, including kangaroo mother care (KMC), as well as disruptors and solutions.
Results We analysed 1120 responses from 62 countries, mainly low and middle-income countries (LMICs). Preparedness for COVID-19 was suboptimal in terms of guidelines and availability of personal protective equipment. One-third reported routine testing of all pregnant women, but 13% had no testing capacity at all. More than 85% of health personnel feared for their own health and 89% had increased stress. Newborn care practices were disrupted both due to reduced care-seeking and a compromised workforce. More than half reported that evidence-based interventions such as KMC were discontinued or discouraged. Separation of the mother–baby dyad was reported for both COVID-positive mothers (50%) and those with unknown status (16%). Follow-up care was disrupted primarily due to families' fear of visiting hospitals (~73%).
Conclusion Newborn care providers are stressed and there is lack clarity and guidelines regarding care of small newborns during the pandemic. There is an urgent need to protect life-saving interventions, such as KMC, threatened by the pandemic, and to be ready to recover and build back better.

32. BMJ Global Health 2021;6:e005669. Editorial
Public health education post-COVID-19: a proposal for critical revisions
Ghaffar A et al.

The ongoing pandemic has clearly shown the global health community that there is a need to further strengthen capacity, competencies and knowledge in some areas of public health taught at this point, such as the politics of public health, working with communities in our approach to community engagement and building trust, and promoting interdisciplinary research. However, there are additional areas of knowledge and competencies that are critical to respond and manage such pandemics. The pandemic demands new investments in schools of public health, so that they develop and implement the delivery of some new courses and methods for achieving relevant competencies. We propose at least four more areas for consideration by schools of public health for the development of new or strengthened educational strategies in preparation of a post-COVID world.
First, and perhaps quite essential, is training and expertise in supply chain management. Supply chain management with a focus on prevention and healthcare is often taught in management schools but is either not covered or required in schools of public health.
A second need is expertise and proficiency to identify and diminish the effect and spread of misinformation and fake news. The WHO calls this an 'infodemic' —a vast array of information online and offline that undermines public health through disinformation and misinformation.
Third, we propose the development of expertise in learning and application of technologies in collection of data, synthesis of available information and dissemination of decisions in a timely manner.
Finally, we believe that a priority setting and resource allocation should become core to any public health curriculum. While lectures on these topics are often found in courses on management, health systems or ethics, they may not be the focus of required courses or covered in depth. The distribution of personal protective equipment, the allocation issues in vaccines, the ethical concerns around criteria, and the need for careful consideration of key technical and moral issues around COVID-19 have unveiled an important need for such skills in health systems.

33. Lancet 2021;397(10277):868-9
World Report: Medical oxygen crisis: a belated COVID-19 response
Usher, AD.

Wellcome Trust, Unitaid, and WHO have established a COVID-19 Oxygen Emergency Taskforce and say that US$90 million is needed to fund an “immediate emergency response”. This response would initially target patients with COVID-19 in up to 20 low-income and middle-income countries (LMICs), including Malawi, Nigeria, and Afghanistan. $1·6 billion will be needed to make medical oxygen available more widely over the coming year.
In a press release, the agencies said that more than half a million patients with COVID-19 in LMICs need oxygen every day and shortages are causing preventable deaths. This figure does not include the millions of patients, including newborn babies and children with pneumonia, malaria, and other ailments, who also require medical oxygen therapy each year.
The global pandemic response mechanism, the Access to COVID-19 Tools Accelerator (ACT-A), has been slow to take up the issue. During the first year of the pandemic, ACT-A and its donors have concentrated overwhelmingly on developing new vaccines. Other tools like oxygen and personal protective equipment failed to generate the same level of interest and engagement.
The new ACT-A taskforce includes the Every Breath Counts pneumonia coalition, Save the Children, the Clinton Health Access Initiative, and PATH, groups that have been sounding the alarm about oxygen shortages in LMICs.
The first indication that oxygen was being given higher priority came on Feb 9, 2021, when ACT-A presented a new budget and strategy. Oxygen was moved out of the health system pillar and into the therapeutics pillar, under the responsibility of the Wellcome Trust and UNITAID. Speaking on condition of anonymity, sources closely involved with ACT-A told The Lancet that this was a way of lifting the attention on oxygen. The move was also a recognition of the fact that it was more logical for a therapy that WHO categorises as an essential medicine to be included with other treatments. One of the few drugs shown to be effective against COVID-19, dexamethasone, works more efficiently when combined with medical oxygen.
In November, as SARS-CoV-2 infection rates in LMICs rose and many countries faced a double burden of pneumonia and COVID-19—two respiratory illnesses that require oxygen treatment—the Every Breath Counts coalition and PATH launched a COVID-19 Oxygen Needs Tracker, to raise awareness about the surge in daily oxygen requirements. The ACT-A oxygen initiative draws heavily on this work: both the $90 million request and the assertion that 500 000 patients with COVID-19 in LMICs need medical oxygen each day are taken directly from the tracker.
However, the numbers generated by the tracker give only a partial picture, for two main reasons. First, the numbers only include COVID-19 cases confirmed by testing, not taking into account the low levels of testing in LMICs, and second, the numbers do not include the oxygen needs of patients without COVID-19, who vastly outnumber people with COVID-19.
After years of neglect, campaigners and health officials hope that the focus on oxygen triggered by COVID-19 will lead to wider availability of medical oxygen, which can be used when the pandemic is over to help patients with pneumonia, malaria, sepsis, and other ailments that require oxygen therapy.

34. Lancet. 2021 Mar 13;397(10278):1023-1034. Epub 2021 Feb 12.
Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment
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The COVID-19 pandemic is unlikely to end until there is global roll-out of vaccines that protect against severe disease and preferably drive herd immunity. Regulators in numerous countries have

authorised or approved COVID-19 vaccines for human use, with more expected to be licensed in 2021. Yet having licensed vaccines is not enough to achieve global control of COVID-19: they also need to be produced at scale, priced affordably, allocated globally so that they are available where needed, and widely deployed in local communities. In this Health Policy paper, we review potential challenges to success in each of these dimensions and discuss policy implications. To guide our review, we developed a dashboard to highlight key characteristics of 26 leading vaccine candidates, including efficacy levels, dosing regimens, storage requirements, prices, production capacities in 2021, and stocks reserved for low-income and middle-income countries. We use a traffic-light system to signal the potential contributions of each candidate to achieving global vaccine immunity, highlighting important trade-offs that policy makers need to consider when developing and implementing vaccination programmes. Although specific datapoints are subject to change as the pandemic response progresses, the dashboard will continue to provide a useful lens through which to analyse the key issues affecting the use of COVID-19 vaccines. We also present original data from a 32-country survey (n=26 758) on potential acceptance of COVID-19 vaccines, conducted from October to December, 2020. Vaccine acceptance was highest in Vietnam (98%), India (91%), China (91%), Denmark (87%), and South Korea (87%), and lowest in Serbia (38%), Croatia (41%), France (44%), Lebanon (44%), and Paraguay (51%).

35. Lancet. 2021 Mar 24;S0140-6736(21)00632-2. Online ahead of print.

The first and second waves of the COVID-19 pandemic in Africa: a cross-sectional study

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Background: Although the first wave of the COVID-19 pandemic progressed more slowly in Africa than the rest of the world, by December, 2020, the second wave appeared to be much more aggressive with many more cases. To date, the pandemic situation in all 55 African Union (AU) Member States has not been comprehensively reviewed. We aimed to evaluate reported COVID-19 epidemiology data to better understand the pandemic's progression in Africa.

Methods: We did a cross-sectional analysis between Feb 14 and Dec 31, 2020, using COVID-19 epidemiological, testing, and mitigation strategy data reported by AU Member States to assess trends and identify the response and mitigation efforts at the country, regional, and continent levels. We did descriptive analyses on the variables of interest including cumulative and weekly incidence rates, case fatality ratios (CFRs), tests per case ratios, growth rates, and public health and social measures in place.

Findings: As of Dec 31, 2020, African countries had reported 2 763 421 COVID-19 cases and 65 602 deaths, accounting for 3·4% of the 82 312 150 cases and 3·6% of the 1 798 994 deaths reported globally. Nine of the 55 countries accounted for more than 82·6% (2 283 613) of reported cases. 18 countries reported CFRs greater than the global CFR (2·2%). 17 countries reported test per case ratios less than the recommended ten to 30 tests per case ratio range. At the peak of the first wave in Africa in July, 2020, the mean daily number of new cases was 18 273. As of Dec 31, 2020, 40 (73%) countries had experienced or were experiencing their second wave of cases with the continent reporting a mean of 23 790 daily new cases for epidemiological week 53. 48 (96%) of 50 Member States had five or more stringent public health and social measures in place by April 15, 2020, but this number had decreased to 36 (72%) as of Dec 31, 2020, despite an increase in cases in the preceding month.

Interpretation: Our analysis showed that the African continent had a more severe second wave of the COVID-19 pandemic than the first, and highlights the importance of examining multiple epidemiological variables down to the regional and country levels over time. These country-specific and regional results informed the implementation of continent-wide initiatives and supported equitable distribution of supplies and technical assistance. Monitoring and analysis of these data over time are essential for continued situational awareness, especially as Member States attempt to balance controlling COVID-19 transmission with ensuring stable economies and livelihoods.

36. TMIH 2021;26(1):115-9
Coronavirus disease-19 deaths among children and adolescents in an area of Northeast, Brazil: why so many?
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Objective: To describe COVID-19 deaths among children and adolescents in Sergipe, Brazil.
Methods: Ecological study of all COVID-19 reported cases and deaths occurring in children and adolescents < 19 years of age in Sergipe reported by the health surveillance and mortality information systems of Sergipe's Health Secretary and hospital records.
Results: Of 37 deaths of children < 19 years old were reported up to 30 September 2020, corresponding to 4.87 deaths for 100 000 population < 19 years old. Most deaths occurred among infants (44.1/100 000), and this age group had the highest case fatality rate (15.3 %). Most children had comorbidities such as chronic neurological diseases (n = 7; 19%) and prematurity (n = 4; 11%). Most children who died (n = 18; 49%) were not admitted to intensive care units (ICUs).
Conclusion: COVID-19 mortality in children and adolescents in Sergipe was higher than in other Brazilian states and in high-income countries. A large proportion of the deaths occurred among children with comorbidities and a minority of children were admitted to ICU, reflecting the limited provision of such beds in the State. Newborns and infants are a high-risk group that must have priority in health public policy

Health Policy

37. BMJ Global Health 2021;6:e004618. Original research
Towards universal health coverage in the WHO African Region: assessing health system functionality, incorporating lessons from COVID-19
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The move towards universal health coverage is premised on having well-functioning health systems, which can assure provision of the essential health and related services people need. Efforts to define ways to assess functionality of health systems have however varied, with many not translating into concrete policy action and influence on system development. We present an approach to provide countries with information on the functionality of their systems in a manner that will facilitate movement towards universal health coverage. We conceptualise functionality of a health system as being a construct of four capacities: access to, quality of, demand for essential services and its resilience to external shocks. We test and confirm the validity of these capacities as appropriate measures of system functionality. We thus provide results for functionality of the 47 countries of the WHO African Region based on this. The functionality of health systems ranges from 34.4 to 75.8 on a 0–100 scale. Access to essential services represents the lowest capacity in most countries of the region, specifically due to poor physical access to services. Funding levels from public and out-of-pocket sources represent the strongest predictors of system functionality, compared with other sources. By focusing on the assessment on the capacities that define system functionality, each country has concrete information on where it needs to focus, in order to improve the functionality of its health system to enable it respond to current needs including achieving universal health coverage, while responding to shocks from challenges such as the 2019 coronavirus disease. This systematic and replicable approach for assessing health system functionality can provide the guidance needed for investing in country health systems to attain universal health coverage goals.

38. BMJ Global Health 2021;6:e002452. Original research

Cost-effectiveness of community health systems strengthening: quality improvement interventions at community level to realise maternal and child health gains in Kenya

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Introduction Improvements in maternal and infant health outcomes are policy priorities in Kenya. Achieving these outcomes depends on early identification of pregnancy and quality of primary healthcare. Quality improvement interventions have been shown to contribute to increases in identification, referral and follow-up of pregnant women by community health workers. In this study, we evaluate the cost-effectiveness of using quality improvement at community level to reduce maternal and infant mortality in Kenya.

Methods We estimated the cost-effectiveness of quality improvement compared with standard of care treatment for antenatal and delivering mothers using a decision tree model and taking a health system perspective. We used both process (antenatal initiation in first trimester and skilled delivery) and health outcomes (maternal and infant deaths averted, as well as disability-adjusted life years (DALYs)) as our effectiveness measures and actual implementation costs, discounting costs only. We conducted deterministic and probabilistic sensitivity analyses.

Results We found that the community quality improvement intervention was more cost-effective compared with standard community healthcare, with incremental cost per DALY averted of $249 under the deterministic analysis and 76% likelihood of cost-effectiveness under the probabilistic sensitivity analysis using a standard threshold. The deterministic estimate of incremental cost per additional skilled delivery was US$10, per additional early antenatal care presentation US$155, per maternal death averted US$5654 and per infant death averted US$37 536 (2017 dollars).

Conclusions This analysis shows that the community quality improvement intervention was cost-effective compared with the standard community healthcare in Kenya due to improvements in antenatal care uptake and skilled delivery. It is likely that quality improvement interventions are a good investment and may also yield benefits in other health areas.

39. Health Policy and Planning, Vol 36 (1), Febr. 2021: 1–13

Socioeconomic inequality in premiums for a community-based health insurance scheme in Rwanda

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Community-based health insurance (CBHI) has gained popularity in many low- and middle-income countries, partly as a policy response to calls for low-cost, pro-poor health financing solutions. In Africa, Rwanda has successfully implemented two types of CBHI systems since 2005, one of which with a flat rate premium (2005–10) and the other with a stratified premium (2011–present). Existing CBHI evaluations have, however, tended to ignore the potential distributional aspects of the household contributions made towards CBHI. In this paper, we investigate the pattern of socioeconomic inequality in CBHI household premium contributions in Rwanda within the implementation periods. We also assess gender differences in CBHI contributions. Using the 2010/11 and 2013/14 rounds of national survey data, we quantify the magnitude of inequality in CBHI payments, decompose the concentration index of inequality, calculate Kakwani indices and implement unconditional quantile regression decomposition to assess gender differences in CBHI expenditure. We find that the CBHI with stratified premiums is less regressive than CBHI with a flat rate premium system. Decomposition analysis indicates that income and CBHI stratification explain a large share of the inequality in CBHI payments. With respect to gender, female-headed households make lower contributions towards CBHI expenditure, compared with male-headed households. In terms of policy implications, the results suggest that there may be a need for increasing the

premium bracket for the wealthier households, as well as for the provision of more subsidies to vulnerable households.

40. Health Policy and Planning, Vol 36 (1), Febr. 2021: 101 - 116

Is patient navigation a solution to the problem of "leaving no one behind"? A scoping review of evidence from low-income countries

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Patient navigation interventions, which are designed to enable patients excluded from health systems to overcome the barriers they face in accessing care, have multiplied in high-income countries since the 1990s. However, in low-income countries (LICs), indigents are generally excluded from health policies despite the international paradigm of universal health coverage (UHC). Fee exemption interventions have demonstrated their limits and it is now necessary to act on other dimensions of access to healthcare. However, there is a lack of knowledge about the interventions implemented in LICs to support the indigents throughout their care pathway. The aim of this paper is to synthesize what is known about patient navigation interventions to facilitate access to modern health systems for vulnerable populations in LICs. We therefore conducted a scoping review to identify all patient navigation interventions in LICs. We found 60 articles employing a total of 48 interventions. Most of these interventions targeted traditional beneficiaries such as people living with HIV, pregnant women and children. We utilized the framework developed by Levesque et al. (Patient-centred access to health care: conceptualising access at the interface of health systems and populations. Int J Equity Health 2013;12:18) to analyse the interventions. All acted on the ability to perceive, 34 interventions on the ability to reach, 30 on the ability to engage, 8 on the ability to pay and 6 on the ability to seek. Evaluations of these interventions were encouraging, as they often appeared to lead to improved health indicators and service utilization rates and reduced attrition in care. However, no intervention specifically targeted indigents and very few evaluations differentiated the impact of the intervention on the poorest populations. It is therefore necessary to test navigation interventions to enable those who are worst off to overcome the barriers they face. It is a major ethical issue that health policies leave no one behind and that UHC does not benefit everyone except the poorest.

41. Health Policy and Planning, Vol 36 (1), Febr. 2021: 117 - 133

Interventions to strengthen the leadership capabilities of health professionals in Sub-Saharan Africa: a scoping review

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Leadership is a critical component of a health system and may be particularly important in Sub-Saharan Africa, where clinicians take on significant management responsibilities. However, there has been little investment in strengthening leadership in this context, and evidence is limited on what leadership capabilities are most important or how effective different leadership development models are. This scoping review design used Arksey and O'Malley's approach of identifying the question and relevant studies, selection, charting of data, summarizing of results and consultation. A comprehensive search strategy was used that included published and unpublished primary studies and reviews. Seven databases were searched, and papers written in English and French between 1979 and 2019 were included. Potential sources were screened against inclusion and exclusion criteria. Data were grouped into common categories and summarized in tables; categories included conceptual approach to leadership; design of intervention; evaluation method; evidence of effectiveness; and implementation lessons. The findings were then analysed in the context of the review question and objectives. Twenty-eight studies were included in the review out of a total of

495 that were initially identified. The studies covered 23 of the 46 countries in Sub-Saharan Africa. The leadership development programmes (LDPs) described were diverse in their design. No consistency was found in the conceptual approaches they adopted. The evaluation methods were also heterogeneous and often of poor quality. The review showed how rapidly leadership has emerged as a topic of interest in health care in Sub-Saharan Africa. Further research on this subject is needed, in particular in strengthening the conceptual and competency frameworks for leadership in this context, which would also inform better evaluation. Our findings support the need for LDPs to be accredited, better integrated into existing systems and to put greater emphasis on institutionalization and financial sustainability from their early development.

HIV

42. TMIH 2021;26(2):184-94

Implementation and operational feasibility of SAMBA I HIV-1 semi-quantitative viral load testing at the point-of-care in rural settings in Malawi and Uganda
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Objective: We monitored a large-scale implementation of the Simple Amplification-Based Assay semi-quantitative viral load test for HIV-1 version I (SAMBA I Viral Load = SAMBA I VL) within Médecins Sans Frontières' HIV programmes in Malawi and Uganda, to assess its performance and operational feasibility.
Methods: Descriptive analysis of routine programme data between August 2013 and December 2016. The dataset included samples collected for VL monitoring and tested using SAMBA I VL in five HIV clinics in Malawi (four peripheral health centres and one district hospital), and one HIV clinic in a regional referral hospital in Uganda. SAMBA I VL was used for VL testing in patients who had been receiving ART for between 6 months and ten years, to determine whether plasma VL was above or below 1000 copies/mL of HIV-1, reflecting ART failure or efficacy. Randomly selected samples were quantified with commercial VL assays. SAMBA I instruments and test performance, site throughput, and delays in communicating results to clinicians and patients were monitored.
Results: Between August 2013 and December 2016 a total of 60 889 patient samples were analysed with SAMBA I VL. Overall, 0.23% of initial SAMBA I VL results were invalid; this was reduced to 0.04% after repeating the test once. Global test failure, including instrument failure, was 1.34%. Concordance with reference quantitative testing of VL was 2620/2727, 96.0% (1338/1382, 96.8% in Malawi; 1282/1345, 95.3% in Uganda). For Chiradzulu peripheral health centres and Arua Hospital HIV clinic, where testing was performed on-site, same-day results were communicated to clinicians for between 91% and 97% of samples. Same-day clinical review was obtained for 84.7% across the whole set of samples tested.
Conclusions: SAMBA I VL testing is feasible for monitoring cohorts of 1000 to 5000 ART-experienced patients. Same-day results can be used to inform rapid clinical decision-making at rural and remote health facilities, potentially reducing time available for development of resistance and conceivably helping to reduce morbidity and mortality.

Malaria

43. Am J Trop Med Hyg. 2020 Dec 21;104(3):979-986.

Cost-Effectiveness of PBO versus Conventional Long-Lasting Insecticidal Bed Nets in Preventing Symptomatic Malaria in Nigeria: Results of a Pragmatic Randomized Trial
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Insecticide treated nets (ITNs) have been the major tool in halving malaria's burden since 2000, but pyrethroid insecticide resistance threatens their ongoing effectiveness. In 2017, the WHO concluded that long-lasting ITNs (LLINs) with a synergist, piperonyl butoxide (PBO), provided additional public health benefit over conventional (pyrethroid-only) LLINs alone in areas of moderate insecticide resistance and endorsed them as a new class of vector control products. We performed an economic appraisal of PBO nets compared with conventional LLINs in 2019 US$ from prevention and health systems perspectives (including treatment cost offsets). We used data from a pragmatic randomized 2012-2014 trial in Nigeria with epidemiological outcomes in an area with confirmed pyrethroid resistance. Each village had 50 months of epidemiologic data, analyzed by village by month, using negative binomial regression. Compared with LLINs, although adding $0.90 per net delivered, PBO nets reduced symptomatic malaria cases by 33.4% (95% CI 10.2-50.6%). From a prevention perspective, the incremental cost-effectiveness ratio was $11 (95% CI $8-$37) per disability-adjusted life year averted. From the health systems perspective, PBO nets were significantly cost-saving relative to conventional LLINs. The benefit-cost analysis found that the added economic benefits of PBO nets over LLINs were $201 (95% CI $61-$304) for every $1 in incremental costs. Growing pyrethroid resistance is likely to strengthen the economic value of PBO nets over LLINs. Beyond their contribution to reducing malaria, PBO nets deliver outstanding economic returns for a small additional cost above conventional LLINs in locations with insecticide resistance.

44. Am J Trop Med Hyg. 2021 Jan;104(1):294-297.
Assessing Village Health Workers' Ability to Perform and Interpret Rapid Diagnostic Tests for Malaria 4 Years after Initial Training: A Cross-Sectional Study
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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. VHWs 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 = 0.83). 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 = 0.60). Overall, VHWs demonstrated proficiency in reading RDTs accurately and performing RDTs according to protocol at least 4 years after initial iCCM training.

45. Am J Trop Med Hyg. 2021 Mar 29. Online ahead of print.
Atovaquone/Proguanil Resistance in an Imported Malaria Case in Chile
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In November 2018, we diagnosed a cluster of falciparum malaria cases in three Chilean travelers returning from Nigeria. Two patients were treated with sequential intravenous artesunate plus oral atovaquone/proguanil (AP) and one with oral AP. The third patient, a 23-year-old man, presented with fever on day 29 after oral AP treatment and was diagnosed with recrudescent falciparum

malaria. The patient was then treated with oral mefloquine, followed by clinical recovery and resolution of parasitemia. Analysis of day 0 and follow-up blood samples, collected on days 9, 29, 34, 64, and 83, revealed that parasitemia had initially decreased but then increased on day 29. Sequencing confirmed Tyr268Cys mutation in the cytochrome b gene, associated with atovaquone resistance, in isolates collected on days 29 and 34 and P. falciparum dihydrofolate reductase mutation Asn51Ile, associated with proguanil resistance in all successfully sequenced samples. Molecular characterization of imported malaria contributes to clinical management in non-endemic countries, helps ascertain the appropriateness of antimalarial treatment policies, and contributes to the reporting of drug resistance patterns from endemic regions.

Mental Health

46. PLoS Med 18(1): e1003468.

Interpersonal psychotherapy delivered by nonspecialists for depression and posttraumatic stress disorder among Kenyan HIV–positive women affected by gender-based violence: Randomized controlled trial.

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Background: HIV–positive women suffer a high burden of mental disorders due in part to gender-based violence (GBV). Comorbid depression and posttraumatic stress disorder (PTSD) are typical psychiatric consequences of GBV. Despite attention to the HIV-GBV syndemic, few HIV clinics offer formal mental healthcare. This problem is acute in sub-Saharan Africa, where the world's majority of HIV–positive women live and prevalence of GBV is high.

Methods and findings: We conducted a randomized controlled trial at an HIV clinic in Kisumu, Kenya. GBV-affected HIV–positive women with both major depressive disorder (MDD) and PTSD were randomized to 12 sessions of interpersonal psychotherapy (IPT) plus treatment as usual (TAU) or Wait List+TAU. Nonspecialists were trained to deliver IPT inside the clinic. After 3 months, participants were reassessed, and those assigned to Wait List+TAU were given IPT. The primary outcomes were diagnosis of MDD and PTSD (Mini International Neuropsychiatric Interview) at 3 months. Secondary outcomes included symptom measures of depression and PTSD, intimate partner violence (IPV), and disability. A total of 256 participants enrolled between May 2015 and July 2016. At baseline, the mean age of the women in this study was 37 years; 61% reported physical IPV in the past week; 91% reported 2 or more lifetime traumatic events and monthly income was 18USD. Multilevel mixed-effects logistic regression showed that participants randomized to IPT+TAU had lower odds of MDD (odds ratio [OR] 0.26, 95% CI [0.11 to 0.60], p = 0.002) and lower odds of PTSD (OR 0.35, [0.14 to 0.86], p = 0.02) than controls. IPT+TAU participants had lower odds of MDD-PTSD comorbidity than controls (OR 0.36, 95% CI [0.15 to 0.90], p = 0.03). Linear mixed models were used to assess secondary outcomes: IPT+TAU participants had reduced disability (−6.9 [−12.2, −1.5], p = 0.01), and nonsignificantly reduced work absenteeism (−3.35 [−6.83, 0.14], p = 0.06); partnered IPT+TAU participants had a reduction of IPV (−2.79 [−5.42, −0.16], p = 0.04). Gains were maintained across 6-month follow-up. Treatment group differences were observed only at month 3, the time point at which the groups differed in IPT status (before cross over). Study limitations included 35% attrition inclusive of follow-up assessments, generalizability to populations not in HIV care, and data not collected on TAU resources accessed.

Conclusions: IPT for MDD and PTSD delivered by nonspecialists in the context of HIV care yielded significant improvements in HIV–positive women's mental health, functioning, and GBV (IPV) exposure, compared to controls.

47. World Psychiatry 20:1 - February 2021

From exception to the norm: how mental health interventions have become part and parcel of the humanitarian response

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Humanitarian psychiatry is the provision of services for mental health and psychosocial support in a humanitarian context – that is, to populations exposed to collective violence, forced displacement or natural disasters. Unfortunately, humanitarian needs have grown: nearly 80 million are forcibly displaced in the world today, that is one in a hundred people, with diminishing numbers returning home. These figures do not include those with humanitarian needs who are not displaced, but who are also in danger, as for example in Yemen at this time.

The publication in 2007 of the Inter-Agency Standing Committee (IASC) Guidelines on Mental Health and Psychosocial Support in Emergency Settings heralded a new understanding and a new approach. Namely, that tightly defined psychiatric problems are only part of a spectrum of mental health and psychosocial needs. These may be prevented or mitigated if people's basic needs for food, shelter and security, and their social needs for connection and justice, are addressed in a dignified and equitable manner that respects human rights (see Silove 2 in this issue of the journal).

This requires multi-sectoral action, with different levels of intensity and specialization. Clinical services constitute a modest part of the pyramid of multi-layered mental health and psychosocial services and supports, the others being: a) focused nonspecialized psychosocial support, b) strengthening the capacity of individuals, families and communities to support themselves, and c) embedding social and psychological considerations into the way basic needs and security are delivered.

That is not to say that clinical needs are insignificant. The latest World Health Organization (WHO) figures show that more than one in five people in post-conflict settings have depression, anxiety disorder, PTSD, bipolar disorder or schizophrenia. Fortunately, certain barriers to addressing psychiatric disorders in emergency settings have been removed. Prior to 2009, mental health problems were not included in the health information system of the United Nations High Commissioner for Refugees (UNHCR), which meant they were invisible. Since then, the inclusion of seven, and currently nine, mental and neurological categories has highlighted the significance of these conditions.

Another problem was that only three psychiatric medications were included in WHO essential drug kits for emergencies. The increase to five in 2011, continued in 2017, has meant that pharmacological treatments are now available in emergencies. The first most significant development of the last decade is the recognition that the provision of essential mental health services is not the exclusive realm of mental health specialists. It can be done by non-specialized health workers, particularly in primary

care, if they are well trained and supervised. The development and rollout, by the WHO and UNHCR, of the Mental Health Gap Action Programme Humanitarian Intervention Guide (mhGAPHIG) for clinical management of mental, neurological and substance use conditions in humanitarian emergencies has played a pivotal role in making non-specialized, community-based delivery possible.

The other main development has been the emergence of a range of brief psychological interventions that can be easily taught to non-specialized staff and community volunteers. These have the potential to be rapidly brought to scale in a relatively cost-effective manner.

Many of these interventions have been purposely developed for, and tested in, humanitarian contexts rather than simply being superficial adaptations of existing tools from high-income settings. In addition, other actors and sectors now recognize that addressing mental health is a major component of humanitarian response. In the last decade, mental health has become increasingly

engrained within policy documents and guidelines. For example, the Sexual and Gender-Based Violence Clinical Guide now includes a chapter on mental health needs; the UN Children's Fund (UNICEF) emphasizes the need for infant stimulation in food emergencies, and the Child Protection Minimum Standards include mental health and psychosocial support.
Where do we go from here? Our immediate priorities are to improve the care for people with severe mental disorders and learning disabilities through a combination of recovery-oriented community interventions and decent medical treatment; to address the neglected domains of alcohol/substance use and prevention/response to suicidal behaviour; and to foster community-based psychosocial methods that focus on social connectedness and interpersonal "healing". Underpinning all of this is continued support and empowerment of local actors on the ground, including affected persons themselves, and a commitment to listen and learn from them.

Non-communicable Diseases

48. BMJ Global Health 2021;6:e003161.Original research

Severe malnutrition or famine exposure in childhood and cardiometabolic non-communicable disease later in life: a systematic review

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Introduction Child malnutrition (undernutrition) and adult non-communicable diseases (NCDs) are major global public health problems. While convincing evidence links prenatal malnutrition with increased risk of NCDs, less is known about the long-term sequelae of malnutrition in childhood. We therefore examined evidence of associations between postnatal malnutrition, encompassing documented severe childhood malnutrition in low/middle-income countries (LMICs) or famine exposure, and later-life cardiometabolic NCDs.
Methods Our peer-reviewed search strategy focused on 'severe childhood malnutrition', 'LMICs', 'famine', and 'cardiometabolic NCDs' to identify studies in Medline, Embase, Global Health, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. We synthesised results narratively and assessed study quality with the UK National Institute for Health and Care Excellence checklist.
Results We identified 57 studies of cardiometabolic NCD outcomes in survivors of documented severe childhood malnutrition in LMICs (n=14) and historical famines (n=43). Exposure to severe malnutrition or famine in childhood was consistently associated with increased risk of cardiovascular disease (7/8 studies), hypertension (8/11), impaired glucose metabolism (15/24) and metabolic syndrome (6/6) in later life. Evidence for effects on lipid metabolism (6/11 null, 5/11 mixed findings), obesity (3/13 null, 5/13 increased risk, 5/13 decreased risk) and other outcomes was less consistent. Sex-specific differences were observed in some cohorts, with women consistently at higher risk of glucose metabolism disorders and metabolic syndrome.
Conclusion Severe malnutrition or famine during childhood is associated with increased risk of cardiometabolic NCDs, suggesting that developmental plasticity extends beyond prenatal life. Severe malnutrition in childhood thus has serious implications not only for acute morbidity and mortality but also for survivors' long-term health. Heterogeneity across studies, confounding by prenatal malnutrition, and age effects in famine studies preclude firm conclusions on causality. Research to improve understanding of mechanisms linking postnatal malnutrition and NCDs is needed to inform policy and programming to improve the lifelong health

49. Lancet 2020;396(10267):2019-82

The Lancet Commission on diabetes: using data to transform diabetes care and patient lives

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In this Lancet Commission on diabetes, which embodies 4 years of extensive work on data curation, synthesis, and modelling, we urge policy makers, payers, and planners to collectively change the ecosystem, build capacity, and improve the clinical practice environment. Such actions will enable practitioners to systematically collect data during routine practice and to use these data effectively to diagnose early, stratify risks, define needs, improve care, evaluate solutions, and drive changes at patient, system, and policy levels to prevent and control diabetes and other non-communicable diseases.

In 2019, 463 million people had diabetes worldwide, with 80% from low-income and middle-income countries. Over 70% of global deaths are due to non-communicable diseases, including diabetes, cardiovascular disease, cancer, and respiratory disease. On average, diabetes reduces life expectancy in people aged 40–60 years by 4–10 years and independently increases the risk of death from cardiovascular disease, renal disease, and cancer by 1·3–3·0 times. Diabetes is among the leading causes of non-traumatic lower extremity amputation and blindness, especially in people of working age. The co-occurrence of these morbidities severely impairs quality of life, reduces productivity, and causes major suffering.

Key messages

- Ensuring access to insulin, patient education, and tools for monitoring blood glucose concentration can prevent premature deaths and emergencies in young patients with type 1 diabetes, especially in disadvantaged communities
- Ensuring access to insulin, patient education, and tools for monitoring blood glucose concentration can prevent premature deaths and emergencies in young patients with type 1 diabetes, especially in disadvantaged communities
- Complex causes, notably psychosocial needs, especially in patients with young-onset diabetes, call for structured assessment to personalise care for reducing premature development of non-communicable diseases and death
- The diverse environmental, behavioural, and socioeconomic causes of type 2 diabetes require a multitiered societal and population-based prevention strategy
- The marked differences in diabetes diagnosis, treatment, and outcomes in low-income and middle-income countries versus those in high-income countries are likely to be due to differences in investment, capacity, health-care systems, and care organisation
- Sustained reduction of common cardiometabolic risk factors, including smoking cessation and use of statins, renin–angiotensin system inhibitors, SGLT2 inhibitors, and GLP-1 receptor agonist therapies can reduce cardiovascular–renal diseases and all-cause death in patients with type 2 diabetes
- The delivery of team-based care can enable systematic collection of data during routine clinical practice to improve the quality of electronic medical records and to establish registers for surveillance, prevention, and treatment
- The strengthening of existing infrastructures to provide continuing integrated care and the creation of career paths for physicians with knowledge and skills to reorganise diabetes care, train non-physician personnel, and use technology effectively can improve the accessibility, sustainability, and affordability of diabetes prevention and care

50. PLoS Med 17(11): e1003268.

Association between country preparedness indicators and quality clinical care for cardiovascular disease risk factors in 44 lower- and middle-income countries: A multicountry analysis of survey data.

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Background: Cardiovascular diseases are leading causes of death, globally, and health systems that deliver quality clinical care are needed to manage an increasing number of people with risk factors for these diseases. Indicators of preparedness of countries to manage cardiovascular disease risk factors (CVDRFs) are regularly collected by ministries of health and global health agencies. We aimed to assess whether these indicators are associated with patient receipt of quality clinical care.
Why was the study done? Diseases such as high blood pressure and diabetes are becoming increasingly common in low- and middle-income countries (LMICs).
Treatment for these conditions is simple and cheap. However, without treatment, sufferers are at high risk of adverse consequences, such as heart attacks and strokes.
It is important therefore to be able to measure whether patients who need treatment are getting it.
Currently, LMICs' progress towards being able to treat patients with hypertension and diabetes is measured using proxies, for example, whether policies, guidelines, funding, structures, or human resources are in place.
What did the researchers find? We measured whether 187,552 people with hypertension living in 43 LMICs and 40,795 people with diabetes living in 28 LMICs had their high blood pressure or diabetes treated well; i.e., they had these conditions diagnosed, treated, or controlled.
We found that most proxy measures were not reflective of whether patients had their condition treated well.
What do these findings mean? To judge countries' progress towards ability to treat hypertension and diabetes requires directly assessing whether people with these diseases are getting the treatment that they need.
The main limitation of the study was that a one-time measurement of blood pressure or blood glucose was used to define whether participants had high blood pressure or diabetes. To make a concrete clinical diagnosis requires more detailed investigation.

51. PLoS Med 17(11): e1003434.
Health system interventions for adults with type 2 diabetes in low- and middle-income countries: A systematic review and meta-analysis
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Background: Effective health system interventions may help address the disproportionate burden of diabetes in low- and middle-income countries (LMICs). We assessed the impact of health system interventions to improve outcomes for adults with type 2 diabetes in LMICs.
Why was this study done? Approximately 80% of the 463 million adults with type 2 diabetes worldwide live in low- and middle-income countries (LMICs).
Evidence-based treatments for diabetes exist, but health systems in LMICs have difficulty meeting diabetes patients' needs.
Health system interventions can help address this gap by improving the delivery of diabetes care within health systems.
What did the researchers do and find? We conducted a systematic review and meta-analysis of 39 health system interventions aiming to improve outcomes of glycemic (i.e., blood glucose) control, mortality, quality of life, or cost-effectiveness for people with type 2 diabetes in LMICs.
We found that health system interventions for type 2 diabetes may be effective in improving glycemic control in LMICs, but few studies were available from rural areas or low- or lower-middle-income countries.

Among intervention types, multicomponent clinic-based interventions had the strongest evidence for improving glycemic control.
What do these findings mean? Our findings support the scaling up of diabetes health system interventions to improve patients' glycemic control in LMICs.
Further research is needed to assess other outcomes beyond glycemic control, especially in rural areas and in low- or lower-middle-income countries.

Sexual and Reproductive Health

52. Am J Trop Med Hyg. 2021 Jan 4;104(3):1085-1092.

The Effect of Ebola Virus Disease on Maternal and Child Health Services and Child Mortality in Sierra Leone, 2014-2015: Implications for COVID-19
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During Sierra Leone's 2014-2015 Ebola virus disease (EVD) epidemic, early reports warned of health system collapse and potential effects on other-cause mortality. These same warnings are reverberating during the COVID-19 pandemic. Consideration of the impacts of EVD on maternal and child health services from facility data can be instructive during COVID-19. We surveyed all peripheral healthcare units (PHUs) in Sierra Leone in October 2014 and March 2015 to assess closures, staffing, amenities, medicines, supplies, and service utilization during May 2014-January 2015 and October 2013-January 2014. We report PHU characteristics and service utilization changes for equivalent 4-month periods during the epidemic and the prior year. We present utilization changes by district and service type, and model excess child mortality. PHU closures (-8%) and staff attrition (-3%) were limited, but many facilities lacked amenities, medicines, and supplies. Utilization of preventive and scheduled services fell more than individualized, clinical care interventions, aside from malaria treatment which declined significantly. Ebola virus disease intensity in districts was weakly associated with utilization, aside from two districts that were severely affected. Modeling suggests utilization declines resulted in 6,782 excess under-five deaths (an increase of 21%) between 2014 and 2015. Ebola virus disease negatively affected service provision, but utilization declined relatively more, particularly for preventive and scheduled interventions. Although these findings are specific to Sierra Leone's EVD epidemic, they illustrate the magnitude of possible effects in other settings due to COVID-19-induced service disruptions, where collateral impacts on child mortality from other preventable causes may far outweigh COVID-19 mortality.

53. Am J Trop Med Hyg. 2021 Jan 25;104(3):812-813.

The Nairobi Summit and Reproductive Justice: Unmet Needs for People with Infertility
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The Nairobi Summit, held in November 2019 and convened by the United Nations Fund for Population Activities, claims to have represented "all nations and peoples, and all segments" of society during its high-level conference. The overall aim of the summit was to mobilize political will and financial commitments that are urgently needed to "finally and fully" implement the 1994 International Conference on Population and Development (ICPD) Program of Action. Despite the recommendation by ICPD to incorporate infertility care in reproductive health services, the new Nairobi Statement largely neglects the topic of infertility. This is particularly troublesome as infertility is a global health problem affecting between 52.6 and 72.4 million couples worldwide, with a high prevalence in low- and middle-income settings. For many people around the world, infertility constitutes an emotional, social, and financial burden, yet appropriate services directed toward preventing and addressing infertility are often inaccessible, unaffordable, or nonexistent. With the

impetus of a wider reproductive justice community, we call for the integration of infertility into global reproductive health research and practice, urging policy makers, practitioners, researchers, activists, and funders worldwide to bring focused attention to addressing challenges posed by a lack of safe, effective, and dignified fertility management among those in need.

54. BMJ Global Health 2021;6:e004659. Original research

Global health without sexual and reproductive health and rights? Analysis of United Nations documents and country statements, 2014–2019

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Introduction The initial International Conference on Population and Development in 1994 contains the first reference to sexual and reproductive health and reproductive rights (SRHR). It has been considered agreed language on SRHR in future United Nations (UN) documents. However, opposition to SRHR in global forums has increased, including in conjunction with an increase in religious, far-right populist politics. This study provides an empirical analysis of UN documents to discover whether opposition to SRHR has resulted in changes in the language on SRHR between and what these changes are.
Methods This is a qualitative policy analysis in which 14 UN resolutions, 6 outcome documents from the Commission on the Status of Women (CSW) and 522 country and group statements and 5 outcome reports from the Commission on Population and Development were collected from the organisations websites from 2014 to 2019. Framework analysis was used. The text from documents was charted and indexed and themes developed from these.
Results The results demonstrated a disappearance of the language on abortion in the CSW outcome documents from 2017 and a change in the language on comprehensive sexuality education in the CSW as well as the UN General Assembly resolutions from 2018. This change included a removal of 'sexuality' to an increased emphasis on the role of families. Furthermore, documents showed an inability of some states to accept any mention of sexual and reproductive health at all, expanding from the usual contestations over abortion.
Conclusion Our findings suggest that the global shift in politics and anti-SRHR actors at UN negotiations and conferences have removed previously agreed on language on SRHR from future UN resolutions and outcome documents. This is a concern for the global realisation of SRHR.

55. Health Policy and Planning, Vol 36 (1), Febr. 2021: 84 - 92

Bypassing high-quality maternity facilities: evidence from pregnant women in peri-urban Nairobi

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Utilization of high-quality maternal care is an important link along the pathway from increased facility-based delivery to improved maternal health outcomes, however women in Nairobi do not all deliver in the highest quality facilities available to them. We explored whether women living in peri-urban Nairobi who live nearby to high-quality facilities bypassed, or travelled farther than, their nearest high technical quality facility using survey data collected before and after delivery from women (n = 358) and from facility assessments (n = 59). We defined the nearest high technical quality facility as the nearest Comprehensive Emergency Obstetric and Newborn Care (CEmONC) capable facility to each woman's neighbourhood. We compared women who delivered in their nearest CEmONC (n = 44) to women who bypassed their nearest CEmONC to deliver in a facility that was farther away (n = 200). Among bypassers, 131 (65.5%) women delivered in farther non-CEmONC facilities with lower technical quality and 69 (34.5%) delivered in farther CEmONCs with higher technical quality capacity compared to their nearby CEmONCs. Bypassers rated their delivery experience higher than non-bypassers. Women who bypassed to deliver in non-CEmONCs were less

likely to have completed four antenatal care visits and to consider delivering in any CEmONC prior to delivery while women who bypassed to deliver in farther CEmONCs paid more for delivery and were more likely to report being able to access emergency funds compared to non-bypassers. Our findings suggest that women in peri-urban Nairobi bypassed their nearest CEmONC facilities in favour of delivering in facilities that provided better non-technical quality care. Bypassers with access to financial resources were also able to deliver in facilities with higher technical quality care. Policies that improve women's delivery experience and ensure that information about facility technical quality is widely distributed may be critical to increase the utilization of high-quality maternity facilities.

56. Sexual and Reproductive Health Matters, 29:1, 1882791

Review Article: Seeking synergies: understanding the evidence that links menstrual health and sexual and reproductive health and rights

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Global efforts to improve menstrual health and sexual and reproductive health and rights (SRHR) are fundamentally intertwined and share similar goals for improving health and well-being and increasing gender equality. Historically, however, the two fields have operated independently and missed opportunities to build upon their biological and sociocultural linkages. Biological touchpoints connecting the two fields include genital tract infections, menstrual disorders, contraception, and menopause. From a sociocultural perspective, intersections occur in relation to the experience of puberty and menarche, gender norms and equity, education, gender-based violence, and transactional sex. We describe evidence linking menstrual health and SRHR and offer recommendations for integration that could strengthen the impact of both fields.

// Recommendations for MH and SRHR integration

Given the connections between MH and SRHR, increased integration of the fields has the potential to help achieve their common goals. By ignoring MH, the SRHR field risks missing opportunities to improve health and well-being and to increase gender equality. Integrating MH and SHRH more intentionally could improve efforts to reduce STI and HIV rates, prevent unintended pregnancies, keep girls in school, reduce gender-based violence, and support women's participation in the workforce. In addition, supporting MH interventions among children and very young adolescents could help address the root causes of and potential contributing factors to negative SRHR outcomes, including the potential to address gender norms while they are more fluid.

We have provided several recommendations for integrating MH and SRHR programming in the sections above. Additional cross-cutting steps which may be relevant for MH and SRHR practitioners, as well as for policy makers, researchers and donors, to better connect these fields and serve their communities include:

- Explicitly incorporate MH into SRHR, including in descriptions and definitions of SRHR, as well as in SRHR policies, guidance, and programmes. In addition, government agencies, implementing organisations, funding groups and others working on SRHR should build their capacity in MH.
- Collect more MH data and evaluate integrated MH-SRHR programmes. While several large-scale demographic surveys and longitudinal studies of adolescents have recently started collecting data on menstrual health, further work is needed to refine and incorporate menstrual health indicators for broader use. Also, efforts are needed to design, pilot, evaluate, and implement programmes and policies that better integrate MH and SRHR.
- Strengthen implementation of comprehensive sexuality education (CSE) that reaches a wide age range of children and adolescents and covers a broad spectrum of age-appropriate topics. Well-developed and well-implemented CSE programmes not only allow children to experience puberty and menstruation with a clear understanding of what is happening to their bodies, but

can also reduce taboos and stigma. Engagement of parents, caregivers and community stakeholders is also critical and can enhance the impact of CSE programmes.
- Support health care providers, including community health workers, to discuss menstruation, menstrual disorders, contraception-induced menstrual changes and management options during provider-client counselling and health education sessions. Providers should have the knowledge and resources to diagnose and treat menstrual disorders and the skills to advise clients about contraceptive-induced menstrual changes, including providing support for self-care. Family planning providers should be trained to deliver messages like those in the NORMAL job aid, including the benefits of reduced or no bleeding, as well as to distribute menstrual products and discuss menstruation and fertility awareness.

Conclusion: Menstrual health is part of the continuum of sexual and reproductive health across the life course. The fields of MH and SHRH have shared values and goals and offer numerous opportunities for linkages that could improve outcomes for both. Supporting individuals to manage their menstruation and MH provides them with dignity and is a human right. As a community committed to health, well-being, and gender equality, SRHR practitioners must embrace MH as an integral part of advocacy, policy and programming.

57. TMIH 2021;26(1):33-44

Beyond severe acute maternal morbidity: a mixed-methods study on the long-term consequences of (severe pre-)eclampsia in rural Tanzania

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Objectives: To explore the long-term (perceived) consequences of (severe pre-)eclampsia in rural Tanzania.

Methods: Women were traced for this mixed-methods study 6-7 years after the diagnosis of (severe pre-)eclampsia. Demographic and obstetric characteristics were noted, and blood pressure was recorded. Questionnaires were used to assess physical and mental health. The qualitative part consisted of semi-structured interviews (SSI). A reference group consisted of women without hypertensive disorders of pregnancy.

Results: Of 74 patients, 25 (34%) were available for follow-up, and 24 were included. Five (20%) had suffered from (pre-)eclampsia twice. Hypertension was more common after (pre-)eclampsia than in the reference group (29% vs. 13%). Thirteen women (56%) had feelings of anxiety and depression, compared to 30% in the reference group. In SSIs, experiences during the index pregnancy were explored, as well as body functions, reproductive life course and limitations in daily functioning, which were shown to be long-lasting.

Conclusions: Women who suffered from (severe pre-)eclampsia may experience long-term sequelae, including hypertension, depression and anxiety. Women lack information about their condition, and some are worried to conceive again. To address their specific needs, a strategy along the continuum of care is needed for women following a complicated pregnancy, starting with a late postnatal care visit 6 weeks after giving birth.

TB

58. BMJ Global Health 2021;6:e005639. Editorial

Increasing tuberculosis burden in Latin America: an alarming trend for global control efforts

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‘Of concern is the WHO Region of the Americas, where incidence is estimated to be slowly increasing after many years of decline, owing to an upward trend in Brazil during 2016–2019.’—2020 Global TB report.

On the 24 March, we will commemorate the World TB Day. Despite important achievements on tuberculosis (TB) control summarised in the 2020 WHO Global TB report,1 the above quotation referring to the WHO Region of the Americas is concerning. In contrast with global decreases in TB incidence rates over the past decade, in 2019, the Region of the Americas has taken a step backwards and the TB incidence rate has shown an unexpected upturn in recent years [bmjgh-2021-005639supp001.pdf]
The Region of the Americas comprises 46 countries and territories and Brazil and Peru are among the WHO high-TB burden countries. To illustrate the recent increase in TB incidence in the region, we selected 12 countries from Latin America (Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela), which account for approximately 80% of the total estimated TB cases in the region. Using data from WHO TB databases (exported on 22 October 2020), we show that, between 2014 and 2019, the estimated TB incidence rate increased from 38.4 to 41.7 per 100 000 (8.6% relative increase) and the estimated number of incident cases increased from 202 290 to 230 100 (27 810 more cases, 13.8% relative increase) for these 12 countries
A first step to mitigate the health impact of this recent trend is to disentangle its main drivers. It is likely this resurgence is due to multiple factors and should be within the framework of already known TB drivers. Researchers, academics and National TB programmes should take advantage of TB morbidity and mortality surveillance to describe where recent increases are occurring in terms of key demographic variables (eg, age and sex), geographical location within each country, and stratified by main groups of interest, such as those with HIV infection and prisoners. Additionally, studies with individual data, allowing for robust estimates of drivers on TB incidence in the region are needed. Other actions in the region should be considered because of their direct impact on improved diagnosis and notification of cases, such as roll out of platforms for molecular testing (GeneXpert), implementation of active contact tracing strategies and improved surveillance systems (quality and coverage). Additionally, research and surveillance should aim to characterise TB transmission dynamics using molecular tools. The introduction of new lineages or resurgence of new strains in the region could be associated with increased transmission, while going unnoticed. Finally, the use of modelling techniques may incorporate data on identified drivers associated with the observed upward trend in TB notifications in several Latin American countries, providing a better understanding and shedding light on mitigation opportunities.

59. Emerg Infect Dis. 2021 Mar;27(3):805-812.
Effectiveness of Preventive Therapy for Persons Exposed at Home to Drug-Resistant Tuberculosis, Karachi, Pakistan
Amyn A Malik, et al.

In Karachi, Pakistan, a South Asian megacity with a high prevalence of tuberculosis (TB) and low HIV prevalence, we assessed the effectiveness of fluoroquinolone-based preventive therapy for drug-resistant (DR) TB exposure. During February 2016–March 2017, high-risk household contacts of DR TB patients began a 6-month course of preventive therapy with a fluoroquinolone-based, 2-drug regimen. We assessed effectiveness in this cohort by comparing the rate and risk for TB disease over 2 years to the rates and risks reported in the literature. Of 172 participants, TB occurred in 2 persons over 336 person-years of observation. TB disease incidence rate observed in the cohort was 6.0/1,000 person-years. The incidence rate ratio ranged from 0.29 (95% CI 0.04–1.3) to 0.50 (95% CI 0.06–2.8), with a pooled estimate of 0.35 (95% CI 0.14–0.87). Overall, fluoroquinolone-based preventive therapy for DR TB exposure reduced risk for TB disease by 65%.

60. TMIH 2021;26(1):45-53
Prevalence and associated risk factors of drug-resistant tuberculosis in Thailand: results from the fifth national anti-tuberculosis drug resistance survey

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Objective: To assess the prevalence and risk factors of drug-resistant tuberculosis (TB), the fifth national anti-TB drug resistance survey was conducted in Thailand.
Methods: A cross-sectional study was conducted by stratified cluster sampling with probability proportional to size of TB cases from public health facilities in 100 clusters throughout Thailand from August 2017 to August 2018. Susceptibility testing of TB isolates to first- and second-line anti-TB drugs was performed on Löwenstein-Jensen medium using the indirect proportion method. Multiple imputation was done for handling missing data using Stata 16. The proportion of TB cases with drug resistance was determined. The odds ratio was used to evaluate risk factors associated with drug-resistant TB.
Results: Among 1501 new TB and 69 previously treated TB cases, 14.0% [95% confidence interval (CI): 12.1-16.1] and 33.4% (95% CI: 23.6-44.8), respectively, had resistance to any anti-TB drug. Multidrug-resistant TB accounted for 0.8% (95% CI: 0.5-1.4) of new TB cases and 13.0% (95% CI: 6.5-24.4) of previously treated TB cases. Drug-resistant TB was associated with prior TB treatment [odds ratio (OR), 2.9; 95% CI: 1.6-5.0], age at 45-54 years (OR, 1.6; 95% CI: 1.0-2.4), male (OR, 1.5; 95% CI: 1.0-2.1) and human immunodeficiency virus (HIV) infection (OR, 1.6; 95% CI: 1.0-2.4).
Conclusions: The burden of drug-resistant TB remains high in Thailand. Intensified prevention and control measures should be implemented to reduce the risks of drug-resistant TB in high-risk groups previously treated, especially individuals of late middle age, males and those with coinfection of TB and HIV.

61. TMIH 2021;26(2):122-32
Review: Diagnostic accuracy of Xpert MTB/RIF for tuberculous meningitis: systematic review and meta-analysis
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Objective: This systematic review evaluated the diagnostic accuracy of Xpert MTB/RIF to detect tuberculous meningitis (TBM).
Methods: PubMed and five other databases were systematically searched through March 2019. All studies evaluating diagnostic accuracy of Xpert MTB/RIF on cerebrospinal fluid (CSF) samples were included. Reference standards were definitive or definite plus probable TBM. The quality of studies was assessed by the QUADAS-2 tool. We performed bivariate random-effects meta-analysis and calculated summary diagnostic statistics.
Results: We identified 30 studies (n = 3972 participants), including 5 cohort studies and 25 cross-sectional studies. Reference standards were definite TB (n = 28 studies) or definite plus probable TBM (n = 6 studies). The pooled Xpert MTB/RIF sensitivity was 85% (95% CI, 70-93%), and specificity was 98% (95% CI, 97-99%) with a negative likelihood ratio of 0.15 (95% CI, 0.04-0.27) for definite TBM. For probable TBM cases, pooled sensitivity was 81% (95% CI, 66-90%), and specificity was 99% (95% CI, 97-99%). For both reference standard types, meta-analyses showed a C-statistic area under the curve of 0.98. The QUADAS-2 tool revealed low risk of bias as well as low concerns regarding applicability. Methodological heterogeneity was high among studies.
Conclusions: Xpert MTB/RIF showed high accuracy for TBM diagnosis, but a negative Xpert MTB/RIF test does not rule out TBM. Repeat Xpert testing may be necessary. In clinical practice, Xpert MTB/RIF adds speed and sensitivity when compared to classic TBM diagnostic methods or previous commercial nucleic acid amplification techniques. More studies and better strategies for rapidly confirming a diagnosis of TBM in children are urgently needed.

Miscellaneous

62. Am J Trop Med Hyg. 2020 Dec 21;104(3):902-906.
Case Report: Nakalanga Syndrome Revisited: Long-Term Follow-Up of a Patient Living in Western Uganda, 1994-2018
Christoph Kaiser et al., Practice for Child and Adolescent Health, Baden-Baden, Germany.

Nakalanga syndrome is a childhood developmental disorder that has been reported from various parts of sub-Saharan Africa with the major sign of retarded growth, regularly combined with physical deformities, impaired mental and pubertal development, and epilepsy. We present a follow-up over a 24-year period of a patient living in the Itwara onchocerciasis focus of western Uganda. We demonstrate the strong similarity of Nakalanga syndrome to the more recently described Nodding syndrome, and we discuss the possible causation of both disorders by onchocerciasis. We suggest that the growing knowledge about the tight interconnections between Nakalanga and nodding syndrome, other forms of epilepsy, and onchocerciasis should be taken into consideration in a revised classification system.

63. Am J Trop Med Hyg. 2021 Jan 11;104(3):1022-1033.
Epidemiological Characteristics, Ventilator Management, and Clinical Outcome in Patients Receiving Invasive Ventilation in Intensive Care Units from 10 Asian Middle-Income Countries (PRoVENT-iMiC): An International, Multicenter, Prospective Study
Luigi Pisani et al., Mahidol-Oxford Tropical Medicine Research Unit (MORU), Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand. for The PRoVENT-iMiC Investigators.

Epidemiology, ventilator management, and outcome in patients receiving invasive ventilation in intensive care units (ICUs) in middle-income countries are largely unknown. PRactice of VENTilation in Middle-income Countries is an international multicenter 4-week observational study of invasively ventilated adult patients in 54 ICUs from 10 Asian countries conducted in 2017/18. Study outcomes included major ventilator settings (including tidal volume [V T] and positive end-expiratory pressure [PEEP]); the proportion of patients at risk for acute respiratory distress syndrome (ARDS), according to the lung injury prediction score (LIPS), or with ARDS; the incidence of pulmonary complications; and ICU mortality. In 1,315 patients included, median V T was similar in patients with LIPS < 4 and patients with LIPS ≥ 4, but lower in patients with ARDS (7.90 [6.8-8.9], 8.0 [6.8-9.2], and 7.0 [5.8-8.4] mL/kg Predicted body weight; P = 0.0001). Median PEEP was similar in patients with LIPS < 4 and LIPS ≥ 4, but higher in patients with ARDS (five [5-7], five [5-8], and 10 [5-12] cmH2O; P < 0.0001). The proportions of patients with LIPS ≥ 4 or with ARDS were 68% (95% CI: 66-71) and 7% (95% CI: 6-8), respectively. Pulmonary complications increased stepwise from patients with LIPS < 4 to patients with LIPS ≥ 4 and patients with ARDS (19%, 21%, and 38% respectively; P = 0.0002), with a similar trend in ICU mortality (17%, 34%, and 45% respectively; P < 0.0001). The capacity of the LIPS to predict development of ARDS was poor (ROC AUC of 0.62, 95% CI: 0.54-0.70). In Asian middle-income countries, where two-thirds of ventilated patients are at risk for ARDS according to the LIPS and pulmonary complications are frequent, setting of V T is globally in line with current recommendations.

64. BMJ Global Health 2021;6:e004252. Analysis
Leaving no one behind in prison: improving the health of people in prison as a key contributor to meeting the Sustainable Development Goals 2030
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Worldwide, approximately 11 million people are currently being held in prison, a number that has steadily grown since the turn of the 21st century. The prison population is more likely to suffer from physical and mental ailments both during and prior to their imprisonment due to poverty, social exclusion and chaotic lifestyles. Recognition of people in prison is noticeably absent from the Sustainable Development Goals (SDGs), despite the goals' ethos of 'leaving no one behind'.
We present the first analysis of how improving the health of people in prison can contribute to achieving 15 SDGs. Relevant indicators are proposed to fulfil these goals while meeting the existing international prison health standards. We also assess the political, economic and social challenges, alongside the unparalleled COVID-19 pandemic that can thwart the realisation of the SDGs. To reach the 'furthest behind first', prison health must be at the forefront of the SDGs.

65. BMJ Global Health 2021;6:e004448. Analysis

Adolescent health in the Sustainable Development Goal era: are we aligned for multisectoral action?
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Adolescents are an increasing proportion of low and middle-income country populations. Their coming of age is foundational for health behaviour, as well as social and productive citizenship. We mapped intervention areas for adolescent sexual and reproductive health, including HIV, mental health and violence prevention to sectors responsible for them using a framework that highlights settings, roles and alignment. Out of 11 intervention areas, health is the lead actor for one, and a possible lead actor for two other interventions depending on the implementation context. All other interventions take place outside of the health sector, with the health sector playing a range of bilateral, trilateral supporting roles or in several cases a minimal role. Alignment across the sectors varies from indivisible, enabling or reinforcing to the other extreme of constraining and counterproductive. Governance approaches are critical for brokering these varied relationships and interactions in multisectoral action for adolescent health, to understand the context of such change and to spark, sustain and steer it.

66. Lancet 2021;397(10269):129-70

Review: The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises
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The Lancet Countdown is an international collaboration established to provide an independent, global monitoring system dedicated to tracking the emerging health profile of the changing climate. The 2020 report presents 43 indicators across five sections: climate change impacts, exposures, and vulnerabilities; adaptation, planning, and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement. This report represents the findings and consensus of the 35 leading academic institutions and UN agencies that make up The Lancet Countdown, and draws on the expertise of climate scientists, geographers, engineers, experts in energy, food, and transport, economists, social, and political scientists, data scientists, public health professionals, and doctors.
Conclusion: With the global average temperature having risen to 1·2°C more than that in preindustrial times, the indicators contained in the 2020 report provide insights into the health impacts of climate change today and in the future. Extremes of heat affect vulnerable populations the most, with some 296 000 deaths occurring as a result of high temperatures in 2018 (indicator 1.1.3).
The climate suitability for the transmission of a range of infectious diseases—dengue fever, malaria, and those caused by Vibrio bacteria—has risen across the world (indicator 1.3.1). At the same time,

crop yield potential has fallen for each of the major crops tracked, with dire consequences anticipated for food-insecure populations (indicator 1.4.1).
And yet, the global response has remained muted. The carbon intensity of the global energy system has been stable during the past three decades, and global coal use for energy increased by 74% during the same period (indicators 3.1.1 and 3.1.2). This rise has resulted in approximately 390 000 deaths from PM2·5 generated by coal-fired power, with total global mortality for all ambient sources exceeding 3·01 million deaths, in 2018 (indicator 3.3). In the agricultural sector, emissions from livestock grew by 16% from 2000 to 2017, with some 990 000 deaths occurring globally from excess red meat consumption in 2017 (indicators 3.5.1 and 3.5.2).
In the face of these problems, the response from the health profession continues to gain momentum. Spending on health system adaptation continued to increase, rising by 12·7% in 2019 to $18·4 billion (indicator 2.4). In just more than 10 years, original research on health and climate change has increased by a factor of eight, and, in half that time, health institutions with total assets of $42 billion have divested their holdings from fossil fuel industries (indicators 5.3 and 4.2.3). Led by low-income countries, more governments are linking health and climate change in their annual speeches at the UN General Debate and their NDCs under the Paris Agreement.
The public health and financial effects of COVID-19 will be felt for years to come, and efforts to protect and rebuild local communities and national economies will need to be robust and sustained. Despite concerning indicators across each section of this report, the 2021 UN Climate Change Conference presents an opportunity for course correction and revitalised NDCs. The window of opportunity is narrow, and, if the response to COVID-19 is not fully and directly aligned with national climate change strategies, the world will be unable to meet its commitments under the Paris Agreement, damaging health and health systems today, and in the future.

67. Lancet 2021;397(10277):928-40
Review: Improving lung health in low-income and middle-income countries: from challenges to solutions
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Low-income and middle-income countries (LMICs) bear a disproportionately high burden of the global morbidity and mortality caused by chronic respiratory diseases (CRDs), including asthma, chronic obstructive pulmonary disease, bronchiectasis, and post-tuberculosis lung disease. CRDs are strongly associated with poverty, infectious diseases, and other non-communicable diseases (NCDs), and contribute to complex multi-morbidity, with major consequences for the lives and livelihoods of those affected. The relevance of CRDs to health and socioeconomic wellbeing is expected to increase in the decades ahead, as life expectancies rise and the competing risks of early childhood mortality and infectious diseases plateau. As such, the World Health Organization has identified the prevention and control of NCDs as an urgent development issue and essential to the achievement of the Sustainable Development Goals by 2030. In this Review, we focus on CRDs in LMICs. We discuss the early life origins of CRDs; challenges in their prevention, diagnosis, and management in LMICs; and pathways to solutions to achieve true universal health coverage.
Conclusions
CRDs contribute substantially to the burden of disease in LMICs. Achieving the SDGs will require action to address this burden of disease through improvements in prevention and care. Poverty reduction measures must be at the core of efforts for prevention, with a specific focus on improving maternal nutrition and health, reducing exposure to airborne contaminants (tobacco smoke, household and atmospheric air pollution, and occupational exposures), and improving the prevention and management of severe or untreated respiratory infections including tuberculosis, especially in early life. Policy action directed at these causes of CRDs will yield benefits in both the short-term and long-term. However, it is likely that a substantial burden of disease will remain, and

evidence-based therapeutic strategies are also required to reduce ongoing morbidity and mortality in people with established CRDs.
Improved data on the epidemiology of CRDs and their risk factors in LMICs are needed. Many knowledge gaps persist, and to merely extrapolate data from HICs might mean disregarding the unique exposures, health system constraints, and social and political contexts that shape diseases in LMICs. Renewed efforts are required to understand the pathophysiology of CRDs and patient outcomes in LMICs, and to develop approaches to diagnosis and management that are feasible, acceptable, and appropriate to local contexts. These approaches should consider heterogeneity within—as well as between—countries. In a world where migration of people is increasing, the relevance of findings from LMICs to communities who have been forced or have chosen to relocate to other parts of the world should also be considered. The universal health coverage agenda offers an ideal opportunity to ensure the needs of those suffering from CRDs are addressed through affordable and sustained access to appropriate and effective diagnostic evaluation, and pharmacological and non-pharmacological therapeutic interventions—goals that are relevant worldwide. CRD services would benefit from integration with broader tuberculosis and NCD care. The balance between programmatic approaches attempting to deliver simple standardised interventions, and personalised approaches seeking to target interventions more precisely, needs careful consideration and should be tailored to the local health-care setting. However, in all contexts, this will require resourcing and capacity building, with specific attention paid to the most peripheral levels of the health-care system. This goal will be a challenge for many LMICs but highlights the importance of health system strengthening, capacity building, and implementation research in realising the potential of universal health coverage to reduce the burden of CRDs worldwide.

68. Lancet Psychiatry 2021 Apr;8(4):320-328.
The hidden burden of eating disorders: an extension of estimates from the Global Burden of Disease Study 2019
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Background: Anorexia nervosa and bulimia nervosa are the only eating disorders included in the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019, yet binge-eating disorder and other specified feeding or eating disorder (OSFED) are more prevalent. This study sought to estimate the prevalence and burden of binge-eating disorder and OSFED globally and present a case for their inclusion in GBD.
Methods: We sourced studies from the GBD 2019 anorexia nervosa and bulimia nervosa epidemiological databases, two systematic reviews that included studies with epidemiological estimates of binge-eating disorder and OSFED, and experts in the field. Studies, published between Jan 1, 1998, and March 1, 2019, were included if they reported non-zero prevalence of two or more eating disorders (anorexia nervosa, bulimia nervosa, binge-eating disorder, or OSFED) and diagnosed cases according to DSM-IV or DSM-5. The proportions of total eating disorder cases that met diagnostic criteria for each individual eating disorder were estimated via network meta-regression and simulation using studies reporting eating disorder prevalence. The global cases unrepresented in GBD 2019 were estimated using the proportions from the simulation and the GBD 2019 eating disorder prevalence. Disability weights for binge-eating disorder and OSFED were then estimated along with disability-adjusted life-years (DALYs). Estimates are presented with 95% uncertainty intervals (UIs).
Findings: 54 studies, of which 36 were from high-income countries, were included in the analysis. The number of global eating disorder cases in 2019 that were unrepresented in GBD 2019 was 41·9 million (95% UI 27·9-59·0), and consisted of 17·3 million (11·3-24·9) people with binge-eating disorder and 24·6 million (14·7-39·7) people with OSFED (vs 13·6 million [10·2-17·5] people with

eating disorders in GBD 2019). Together, binge-eating disorder and OSFED caused 3·7 million (95% UI 2·0-6·5) DALYs globally, bringing the total eating disorder DALYs to 6·6 million (3·8-10·6) in 2019. Interpretation: Binge-eating disorder and OSFED accounted for the majority of eating disorder cases and DALYs globally. These findings warrant the inclusion of binge-eating disorder and OSFED in future iterations of GBD, which will bring the burden experienced by people living with these disorders to the attention of policy makers with the means to target this burden.