International Health Alerts 2020-1 Contents

urban settings: a potential strategy for progress towards universal health coverage

Sexual and Reproductive Health

Miscellaneous

International Health Alerts 2020-1 Abstracts

Communicable Diseases

1. Am J TMH 2019;101(6):1405-15
The Economic Burden of Malaria: Revisiting the Evidence

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A portion of the economics literature has long debated about the relative importance of historical, institutional, geographical, and health determinants of economic growth. In 2001, Gallup and Sachs quantified the association between malaria and the level and growth of per capita income over the period 1965-1995 in a cross-country regression framework. We took a contemporary look at Gallup and Sachs' seminal work in the context of significant progress in malaria control achieved globally since 2000. Focusing on the period 2000-2017, we used the latest data available on malaria case incidence and other determinants of economic growth, as well as macro-econometric methods that are now the professional norm. In our preferred specification using a fixed-effects model, a 10% decrease in malaria incidence was associated with an increase in income per capita of nearly 0.3% on average and a 0.11 percentage point faster per capita growth per annum. Greater average income gains were expected among higher burden countries and those with lower income. Growth of industries with the same level of labor intensity was found to be significantly slower in countries with higher malaria incidence. To analyze the causal impact of malaria on economic outcomes, we used malaria treatment failure and pyrethroid-only insecticide resistance as exogenous instruments in two-stage least squares estimations. Despite several methodological challenges, as expected in these types of analyses, our

findings confirm the intrinsic link between malaria and economic growth and underscore the importance of malaria control in the agenda for sustainable development.

Estimation of Malaria-Attributable Fever in Malaria Test-Positive Febrile Outpatients in Three Provinces of Mozambique, 2018

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Like most malaria-endemic countries, Mozambique relies on tabulation of confirmed malaria test-positive febrile patients to track incidence of malaria. However, this approach is potentially biased by incidental malaria parasitemia in patients with fever of another etiology. We compared pan-Plasmodium aldolase and lactate dehydrogenase and Plasmodium falciparum histidine-rich protein 2 (PfHRP2) antigen concentrations measured using a laboratory bead-based assay of samples collected from 1,712 febrile and afebrile patients of all ages in Maputo, Zambézia, and Cabo Delgado provinces. We used a Bayesian latent class model to estimate the proportion of malaria-attributable fevers in malaria test-positive febrile patients. Depending on the antigen, estimated rates of malaria-attributable fever in malaria test-positive febrile patients were 100% in Maputo, 33-58% in Zambézia, and 63-74% in Cabo Delgado. Our findings indicate that most malaria test-positive febrile patients in the three provinces of Mozambique had a fever that was likely caused by the concurrent malaria infection. Counting malaria test-positive febrile patients for estimation of malaria incidence appears to be appropriate in this setting.

The Role of Spatial Repellant Devices to Prevent Malaria in Low-Income Countries: A Case Study

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Malaria is the leading cause of morbidity and mortality in Uganda. The role of spatial repellent devices in preventing malaria is controversial. The goal of this study was to evaluate the populations' acceptability of a newly designed insecticide diffuser. We distributed to three families living in southern Uganda a device commercially available, the VAPE® portable set. This spatial repellent device offers several advantages compared with other traditional products. It is powered by lithium batteries that guarantee 20 days of uninterrupted delivery of insecticide; it contains two insecticides: empenthrin and transfluthrin; and it is simple to use, one switch to turn it "on" and/or "off." It is odorless, and it can be placed anywhere in the living/sleeping area. People can also carry it outside the house. We planned to evaluate people's compliance with its usage, its reliability, and its overall costs. We conducted a 5-month survey. We distributed the devices to three households, one device per bedroom. Ten males and 11 females, with a mean age of 26 ± 16 (range 10-51) years, lived in these houses. The compliance with the use of the device and its acceptability were high. No side effects were reported. No individual contracted malaria during the 5-month period. The major obstacle we found was the timely delivery of the devices to the evaluation area and initial compliance with the instructions on how to use the device. Larger randomized studies are needed to clarify whether there is a role for this type of spatial repellent devices in the global efforts to prevent malaria.

Biologics in Leprosy: A Systematic Review and Case Report

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TNF-α inhibitors increase susceptibility to tuberculosis, but the effect of biologics on susceptibility to leprosy has not been described. Moreover, biologics may play a role in treating erythema nodosum leprosum (ENL). The objectives of this systematic review were to determine whether the development

of clinical leprosy is increased in patients being treated with biologics and to assess the use of biologics in treating leprosy reactions. A systematic literature review was completed of patients with leprosy who received treatment with biologics either before or after a diagnosis of leprosy was confirmed. All studies and case reports were included for qualitative evaluation. The search yielded 10 cases (including one duplicate publication) of leprosy diagnosed after initiation of TNF-α inhibitors and four case reports of refractory ENL successfully treated with infliximab or etanercept. An unpublished case of persistent ENL responsive to infliximab is also presented. These data demonstrate that the use of TNF-α inhibitors may be a risk factor for developing leprosy or reactivating subclinical infections. Leprosy can present with skin lesions and arthritis, so leprosy should be considered in patients presenting with these signs before starting treatment with these agents. Leprosy should be considered in patients who develop worsening eruptions and neurologic symptoms during treatment

5. Am J TMH 2020;Mar 11

How Is the World Responding to the 2019 Coronavirus Disease Compared with the 2014 West African Ebola Epidemic? The Importance of China as a Player in the Global Economy
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This article describes similarities and differences in the response of governments and the international community to the current 2019 coronavirus disease (COVID-19) and the 2014 West African Ebola epidemic. It expresses the opinion that the speed and scale of the response to the 2019 COVID-19 are affected by the important role that China plays in the global economy. By contrast, insufficient and less timely action was initially undertaken in West African countries during the 2014 Ebola epidemic. It concludes by stating why preparedness for and response to all disease outbreaks, also in countries of lower economic importance, should become a priority in the global health agenda.

6. BMJ GH 2020;5(3):e001955

Original research
Forty-two years of responding to Ebola virus outbreaks in Sub-Saharan Africa: a review
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Introduction. Ebola virus disease (EVD) is one of the deadliest haemorrhagic fevers affecting humans and non-human primates. Thirty-four outbreaks have been reported in Africa since it was first recognised in 1976. This review analysed 42 years of EVD outbreaks and identified various challenges and opportunities for its control and prevention in Sub-Saharan Africa.
Methods. A literature search of relevant articles on EVD was done in PubMed, Web of Science and Google Scholar electronic databases. Articles published from 1976 to 2019 were reviewed to document reports of EVD outbreaks in Sub-Saharan Africa. Data extraction focused on the year of outbreak, geographical spread, virus strain involved, number of cases and deaths, case fatality, and outbreak management. Analyses of trends in case fatality were performed by calculating ORs between times.
Results. In the past four decades, a total of 34 EVD outbreaks affecting 34 356 cases and causing 14 823 deaths were reported in 11 countries in Sub-Saharan Africa. The overall case fatality rate (95% CI) was 66% (62 to 71) and did not change substantially over time (OR in 2019 vs 1976=1.6 (95% CI 1.5 to 1.8), p<0.001). The results of this review indicate that challenges to control EVD outbreaks are related to epidemiological, sociocultural and health system factors.
Conclusions. Sub-Saharan Africa continues to face considerable challenges in EVD control, whereby there are no significant changes in case fatality rates observed during the past four decades. Socioeconomic and cultural processes need to be critically considered to shape the community behaviours that lead to exposure to EVD outbreaks. Areas that need to be addressed to prevent future EVD outbreaks include a broad-based, one-health approach, effective communication, social mobilisation, and strengthening of the health systems.

Global Health

Editorial
Enhancing global health engagement in 21st century China
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Introduction. Since the opening up and reforms that began 40 years ago, China's economy and society have developed rapidly. It is estimated that between 1978 and 2017, China's Gross Domestic Product (GDP) increased on an average of 9.5% annually, and per-capita GDP growth was about 22.8-fold. During the same period, more than 700 million Chinese people were lifted out of poverty. Consequently, China has become a much healthier nation. The average life expectancy in China rose from 65.2 years in 1978 to 76 years in 2017. China did remarkably well in meeting the Millennium Development Goals of reducing infant mortality and improving maternal health. For example, under-five mortality dropped from 54·1 death per 1000 live births in 1990 to 12·5 per 1000 live births in 2015. Similarly, the maternal mortality ratio declined from 111·0 deaths per 100 000 live births to 21·8 per 100 000 live births during the same time.

China has also established the most extensive universal health insurance network in the world, covering more than 95% of the population since 2011. Less than 50% of the Chinese population had any health insurance in 2005. About 97% of the rural population (approximately 45% of the Chinese population) have access to health insurance under the Rural Cooperative Medical Scheme. Similarly, since 2008, the vaccination rate reached more than 90% coverage rate under the National Immunization Program. As part of China's ongoing effort for global engagement, a new China International Development Cooperation Agency (CIDCA) was launched in 2018; a platform for China to better participate in global health governance, as its status changed from being a recipient country to a donor country. In this editorial, we highlight China's contribution to global health in the last four decades and the opportunities ahead as China establishes itself a major player in global health.

China's global health aid. Developmental assistance for health (DAH), including humanitarian aid, is a significant issue in contemporary international politics. Throughout the 20th century, China has actively participated in numerous global health activities. China had provided nearly ¥400 billion of development assistance to 166 countries and international organisations and dispatched more than 600 000 aid workers. A recent example is China's role in containing the 2013–2016 outbreak of Ebola. China has also offered emergency aid to several West African countries with weak public health infrastructure and human resources as well as offer support to WHO and United Nations' public health governance system. As shown in a recent BMJ Global Health paper, DAH from China saw substantial increase in total funding between 2007 and 2017. Although China's contribution for DAH is among top 10 for donor countries, its contribution relative to the population size and the GDP is still far behind the traditional countries participated in global developmental assistance.

China's foreign aid for global health is often provided in five general sectors, medical teams, hospital development, drug and equipment donations, healthcare employee training and infectious disease control such as malaria, with the most significant component of aid being aimed at medical teams and facilities. In a keynote speech delivered at the opening ceremony of the 2018 Beijing Summit of the Forum on China–Africa Cooperation, the Chinese President Xi Jinping announced its decision to revitalise 50 medical and health aid programs in Africa, including the African Center for Disease Control and Prevention and China–Africa Friendship Hospitals.

Conclusion. Health is a vital pillar of a knowledge-based economy. As an emerging and increasingly dominant economy, China is expected to, and will likely take on more responsibilities and gain more influence in global health governance. But to realise its potential and enhance its influence, China will need to develop a clear global health agenda, establish itself as a credible global health actor, continue its focus on environmental issues, increase its focus on food safety standards, increase its cooperation with international organisations and multilateral initiatives, support health infrastructure development in low-income countries with a focus on electronic health infrastructure, train and retain foreign scholars in China, and develop global health training programmes for students in China. Even with

ongoing challenges, including addressing its domestic health issues, China has a vital role to play in making the world a healthier place.

The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate
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The Lancet Countdown is an international, multidisciplinary collaboration, dedicated to monitoring the evolving health profile of climate change, and providing an independent assessment of the delivery of commitments made by governments worldwide under the Paris Agreement.

The 2019 report presents an annual update of 41 indicators across five key domains: climate change impacts, exposures, and vulnerability; adaptation, planning, and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement. The report represents the findings and consensus of 35 leading academic institutions and UN agencies from every continent. Each year, the methods and data that underpin the Lancet Countdown's indicators are further developed and improved, with updates described at each stage of this report. The collaboration draws on the world-class expertise of climate scientists; ecologists; mathematicians; engineers; energy, food, and transport experts; economists; social and political scientists; public health professionals; and doctors, to generate the quality and diversity of data required.

The data published here elucidate the ongoing trends of a warming world with effects that threaten human wellbeing. As the fourth hottest year on record, 2018 saw a record-breaking 220 million additional exposures to extremes of heat, coupled with corresponding increased vulnerability to heat across every continent. As a result of this and broader climatic changes, vectorial capacity for the transmission of dengue fever was the second highest recorded, with 9 of the past 10 most suitable years occurring since 2000. Progress in mitigation and adaptation remains insufficient, with the carbon intensity of the energy system remaining flat; 2·9 million ambient air pollution deaths; and a reversal of the previous downward trend of coal use.

Despite this slow progress, as the material effects of climate change reveal themselves, so too does the world's response. 51 of the 101 countries tracked have developed national health adaptation plans, 70 countries provide climate information services to the health sector, 109 countries have medium to high implementation of a national health emergency framework, and 69% of cities have mapped out risk and vulnerability assessments. Health adaptation funding continues to climb, with health-related funding now responsible for 11·8% of the global adaptation spend. Finally, public and political engagement continues to grow, with heightened interest around the school climate strikes, the UNFCCC's annual meetings, and divestment announcements from medical and health associations.

The last three decades have witnessed the release of increasingly concerning scientific data showing the importance of a reduction in greenhouse-gas emissions. Although the report discusses several positive indicators, CO2 emissions continue to rise. The health implications of this are apparent today and will most certainly worsen without immediate intervention.

Despite increasing public attention over the past 12 months, the world is yet to see a response from governments which matches the scale of the challenge. The role of the health profession is essential—communicating the health risks of climate change and driving the implementation of a robust response which will improve human health and wellbeing.

With the full force of the Paris Agreement to be implemented in 2020, a crucial shift must occur—one which moves from discussion and commitment, to meaningful reductions in emissions.

Corruption in global health: the open secret
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Corruption is embedded in health systems. Throughout my life-as a researcher, public health worker, and a Minister of Health-I have been able to see entrenched dishonesty and fraud. But despite being

one of the most important barriers to implementing universal health coverage around the world, corruption is rarely openly discussed. In this Lecture, I outline the magnitude of the problem of corruption, how it started, and what is happening now. I also outline people's fears around the topic, what is needed to address corruption, and the responsibilities of the academic and research communities in all countries, irrespective of their level of economic development. Policy makers, researchers, and funders need to think about corruption as an important area of research in the same way we think about diseases. If we are really aiming to achieve the Sustainable Development Goals and ensure healthy lives for all, corruption in global health must no longer be an open secret.

10. Lancet 2020;395(10219):200-11

Global, regional, and national sepsis incidence and mortality, 1990-2017: analysis for the Global Burden of Disease Study
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Background: Sepsis is life-threatening organ dysfunction due to a dysregulated host response to infection. It is considered a major cause of health loss, but data for the global burden of sepsis are limited. As a syndrome caused by underlying infection, sepsis is not part of standard Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) estimates. Accurate estimates are important to inform and monitor health policy interventions, allocation of resources, and clinical treatment initiatives. We estimated the global, regional, and national incidence of sepsis and mortality from this disorder using data from GBD 2017.
Methods: We used multiple cause-of-death data from 109 million individual death records to calculate mortality related to sepsis among each of the 282 underlying causes of death in GBD 2017. The percentage of sepsis-related deaths by underlying GBD cause in each location worldwide was modelled using mixed-effects linear regression. Sepsis-related mortality for each age group, sex, location, GBD cause, and year (1990-2017) was estimated by applying modelled cause-specific fractions to GBD 2017 cause-of-death estimates. We used data for 8·7 million individual hospital records to calculate in-hospital sepsis-associated case-fatality, stratified by underlying GBD cause. In-hospital sepsis-associated case-fatality was modelled for each location using linear regression, and sepsis incidence was estimated by applying modelled case-fatality to sepsis-related mortality estimates.
Findings: In 2017, an estimated 48·9 million (95% uncertainty interval [UI] 38·9-62·9) incident cases of sepsis were recorded worldwide and 11·0 million (10·1-12·0) sepsis-related deaths were reported, representing 19·7% (18·2-21·4) of all global deaths. Age-standardised sepsis incidence fell by 37·0% (95% UI 11·8-54·5) and mortality decreased by 52·8% (47·7-57·5) from 1990 to 2017. Sepsis incidence and mortality varied substantially across regions, with the highest burden in sub-Saharan Africa, Oceania, south Asia, east Asia, and southeast Asia.
Interpretation: Despite declining age-standardised incidence and mortality, sepsis remains a major cause of health loss worldwide and has an especially high health-related burden in sub-Saharan Africa.

11. Lancet 2020;395(10219):240-6

Monitoring the health-related Sustainable Development Goals: lessons learned and recommendations for improved measurement
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The UN General Assembly launched the Sustainable Development Goals (SDGs) in September, 2015. The original global SDG framework included 17 goals, 169 targets, and 232 unique indicators.2 Of these, 12 goals, 33 targets, and 57 indicators have been identified as health-related SDGs (HRSDGs), that is, pertaining to health outcomes, health services, and well-established environmental, occupational, behavioural, and metabolic risks. The scope of health in the SDGs is much broader than in the Millennium Development Goals, spanning from maternal and child health and infectious diseases to non-communicable diseases, injuries, risk factors, and health-system functions. Regular monitoring of the HRSDGs is important for fostering a shared notion of accountability for results, identifying important gaps in resources and rates of progress, and taking into account emerging

challenges that can influence the trajectory of progress. Regular monitoring and accountability will be essential to sustain policy focus and funding for the broad and complex HRSDG agenda.

In this Viewpoint, we examine why HRSDG results can differ so much across these empirical monitoring efforts and make recommendations on moving towards more standardised, universal assessments.

Conclusion. The science of measuring the HRSDGs must be a guiding principle for sound measurement. Good measurement itself is not political—rather, the actions that are based on good measurement are political, as societies must make their own decisions and agendas, informed by the available data, national values, and social priorities. If the necessary data are collected, and the processing and synthesis steps standardised, results should not substantively vary on the basis of who conducts the analysis. These developments will naturally lead to a single, consistent, and transparently documented number for every HRSDG indicator. The scientific community has a crucial role in advancing the procedures and methods to support robust measurement of the HRSDGs.

12. Plos Med 2019;16(10):e1002946

High quality health systems in the SDG era: Country-specific priorities for improving quality of care

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Long a concern in high-income countries, health system quality emerged as a truly global priority in 2018. Three major reports and an increasing body of empirical work (e.g., identified deep and pervasive deficits in quality undermining progress toward the Sustainable Development Goal (SDG) of health and wellness for all by 2030. Whether this attention translates into effective action in the near future will depend on national leaders seizing the opportunity to change health systems for improved outcomes. How can policymakers and researchers coordinate to ensure that action is informed by evidence and that policy changes are assessed for generalizable insight? To address this question, we gathered leaders in global health active along a spectrum from generating insight in individual studies to making policy that affects millions of individuals and present some of their thoughts here. All have identified health system quality as a key element of progress; each brings a distinct perspective on what change will require in their country or context. As those setting the agenda in countries from India to Mexico, how do they see the future for health system quality? What is needed from the research community to accelerate progress towards improved health?

Although priorities vary by country, health systems around the world are struggling to deliver high-quality care in the face of the long-standing challenges of maternal and child health and infectious diseases, along with the growing epidemic of noncommunicable disease. We call for research to channel people's voices, develop tools specifically for LMIC settings, test the reshaping of health systems to align care delivery with minimum quality standards, and learn from individual patient outcomes over time to inform system strengthening. Only then will health systems truly deliver for all.

Mental Health

13. BMJ GH 2020;5(3):e002014

Original research

Delivering mental health and psychosocial support interventions to women and children in conflict settings: a systematic review

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Background. Over 240 million children live in countries affected by conflict or fragility, and such settings are known to be linked to increased psychological distress and risk of mental disorders. While guidelines are in place, high-quality evidence to inform mental health and psychosocial support (MHPSS) interventions in conflict settings is lacking. This systematic review aimed to synthesise existing information on the delivery, coverage and effectiveness of MHPSS for conflict-affected women and children in low-income and middle-income countries (LMICs).

Methods. We searched Medline, Embase, Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Psychological Information Database (PsycINFO)databases for indexed literature published from January 1990 to March 2018. Grey literature was searched on the websites of 10 major humanitarian organisations. Eligible publications reported on an MHPSS intervention delivered to conflict-affected women or children in LMICs. We extracted and synthesised information on intervention delivery characteristics, including delivery site and personnel involved, as well as delivery barriers and facilitators, and we tabulated reported intervention coverage and effectiveness data.

Results. The search yielded 37 854 unique records, of which 157 were included in the review. Most publications were situated in Sub-Saharan Africa (n=65) and Middle East and North Africa (n=36), and many reported on observational research studies (n=57) or were non-research reports (n=53). Almost half described MHPSS interventions targeted at children and adolescents (n=68). Psychosocial support was the most frequently reported intervention delivered, followed by training interventions and screening for referral or treatment. Only 19 publications reported on MHPSS intervention coverage or effectiveness.

Discussion. Despite the growing literature, more efforts are needed to further establish and better document MHPSS intervention research and practice in conflict settings. Multisectoral collaboration and better use of existing social support networks are encouraged to increase reach and sustainability of MHPSS interventions.

Suicide

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Throughout the world, approximately 800,000 people die by suicide every year, accounting for 1.5% of all deaths. Suicide is the 10th leading cause of death in North America and the foremost cause of death worldwide among persons 15 to 24 years of age.

The World Health Organization (WHO) estimated that the 2016 suicide rate was 10.6 suicides per 100,000 persons, with 80% of suicides occurring in low- and middle-income countries. Across the six WHO regions, the incidence of suicide differed by a factor of 4 between the region with the highest rate (Europe) and the region with the lowest rate (the Eastern Mediterranean, including the Middle East). Explanations for this variation include differences in the classification of suicide, sociocultural attitudes toward suicide, access to lethal means of dying by suicide, and the adequacy of treatment for mental disorders. Worldwide, suicide rates vary according to age and sex, with the highest rates among older people and with higher rates among men (15.6 suicides per 100,000) than among women (7.0 per 100,000). Suicide rates have been declining over recent decades in most of these regions, with an estimated 18% reduction from 2000 to 2016. The exception is the Americas; in the United States, rates have increased by 1.5% annually since 2000, and rates among men 45 to 64 years of age increased from 21 suicides per 100,000 in 1999 to 30 per 100,000 in 2017.

It is advantageous to consider the following five points in assessing and managing the risk of suicide. First, a person who presents with suicidal thoughts may be at risk for suicide even if there are few overt symptoms of a psychiatric disorder. Second, suicide risk should be assessed by considering predisposing and precipitating factors, including recent life events. Third, the risk of suicide should be managed through regular follow-up and brief psychological therapy; for persons with symptoms of mental illness, pharmacologic treatment should also be considered. Fourth, the suicidal person, family members, and those who provide care should all take part in ensuring a safe environment, with removal of the means of suicide such as guns. Finally, if the risk of suicide is considered to be high or uncertain, the person should be referred immediately to mental health services, and the use of risk-assessment tools should be considered to aid risk stratification and communication among services. Mental health professionals have emphasized that developing and maintaining a therapeutic relationship is central to reducing suicide risk. The following steps can be taken in evaluating someone who has inflicted self-harm: inquire nonjudgmentally about the incident to establish the intent of the self-harm; determine how ideation was acted on; assess the risk of repetition, using structured

approaches that can be supplemented with risk-assessment tools; identify psychological, social, and psychiatric needs; and establish an individual treatment plan that incorporates safety planning and restriction of lethal methods. Management of suicidality calls for a comprehensive approach to assessment and treatment. Assessment should focus on past suicidal behavior, openly addressing ongoing suicidal ideas and psychosocial needs. Assessment of the risk of self-harm and completed suicide may increasingly draw on new technologies such as clinical decision-making tools and safety planning to establish evidence-based practices.

Psychiatric morbidity and suicidal behaviour in low- and middle-income countries: A systematic review and meta-analysis
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Background: Psychiatric disorders are reported to be present in 80% to 90% of suicide deaths in high-income countries (HIC), but this association is less clear in low- and middle-income countries (LMIC). There has been no previous systematic review of this issue in LMIC. The current study aims to estimate the prevalence of psychiatric morbidity in individuals with suicidal behaviour in LMIC. Methods and findings: PubMed, PsycINFO, and EMBASE searches were conducted to identify quantitative research papers (any language) between 1990 and 2018 from LMIC that reported on the prevalence of psychiatric morbidity in suicidal behaviour. We used meta-analytic techniques to generate pooled estimates for any psychiatric disorder and specific diagnosis based on International classification of disease (ICD-10) criteria. A total of 112 studies (154 papers) from 26 LMIC (India: 25%, China: 15%, and other LMIC: 60%) were identified, including 18 non-English articles. They included 30,030 individuals with nonfatal suicidal behaviour and 4,996 individuals who had died by suicide. Of the 15 studies (5 LMIC) that scored highly on our quality assessment, prevalence estimates for psychiatric disorders ranged between 30% and 80% in suicide deaths and between 3% and 86% in those who engaged in nonfatal suicidal behaviour. There was substantial heterogeneity between study estimates. Fifty-eight percent (95% CI 46%−71%) of those who died by suicide and 45% (95% CI 30%−61%) of those who engaged in nonfatal suicidal behaviour had a psychiatric disorder. The most prevalent disorder in both fatal and nonfatal suicidal behaviour was mood disorder (25% and 21%, respectively). Schizophrenia and related disorders were identified in 8% (4%−12%) of those who died by suicide and 7% (3%−11%) of those who engaged in nonfatal suicidal behaviour. In nonfatal suicidal behaviour, anxiety disorders, and substance misuse were identified in 19% (1%−36%) and 11% (7%−16%) of individuals, respectively. This systematic review was limited by the low number of high-quality studies and restricting our searches to databases that mainly indexed English language journals.
Conclusions: Our findings suggest a possible lower prevalence of psychiatric disorders in suicidal behaviour in LMIC. We found very few high-quality studies and high levels of heterogeneity in pooled estimates of psychiatric disorder, which could reflect differing study methods or real differences. There is a clear need for more robust evidence in order for LMIC to strike the right balance between community-based and mental health focussed interventions.

Non-Communicabel Diseases

Investigating associations between rural-to-urban migration and cardiometabolic disease in Malawi: a population-level study
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Background. The extent to which rural-to-urban migration affects risk for cardiometabolic diseases (CMD) in Africa is not well understood. We investigated prevalence and risk for obesity, diabetes, hypertension and precursor conditions by migration status.

Methods. In a cross-sectional survey in Malawi (February 2013–March 2017), 13 903 rural, 9929 rural-to-urban migrant and 6741 urban residents (≥18 years old) participated. We interviewed participants, measured blood pressure and collected anthropometric data and fasting blood samples to estimate population prevalences and odds ratios, using negative binomial regression, for CMD, by migration status. In a sub-cohort of 131 rural–urban siblings-sets, migration-associated CMD risk was explored using conditional Poisson regression.

Results. In rural, rural-to-urban migrant and urban residents, prevalence estimates were; 8.9, 20.9 and 15.2% in men and 25.4, 43.9 and 39.3% in women for overweight/obesity; 1.4, 2.9 and 1.9% in men and 1.5, 2.8 and 1.7% in women for diabetes; and 13.4, 18.8 and 12.2% in men and 13.7, 15.8 and 10.2% in women for hypertension. Rural-to-urban migrants had the greatest risk for hypertension (adjusted relative risk for men 1.18; 95% confidence interval 1.04–1.34 and women 1.17: 95% confidence interval 1.05–1.29) and were the most screened, diagnosed and treated for CMD, compared with urban residents. Within sibling sets, rural-to-urban migrant siblings had a higher risk for overweight and pre-hypertension, with no evidence for differences by duration of stay.

Conclusions. Rural-to-urban migration is associated with increased CMD risk in Malawi. In a poor country experiencing rapid urbanization, interventions for the prevention and management of CMD, which reach migrant populations, are needed.

Global, regional, and national burden of chronic kidney disease, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017
GBD Chronic Kidney Disease Collaboration

Background: Health system planning requires careful assessment of chronic kidney disease (CKD) epidemiology, but data for morbidity and mortality of this disease are scarce or non-existent in many countries. We estimated the global, regional, and national burden of CKD, as well as the burden of cardiovascular disease and gout attributable to impaired kidney function, for the Global Burden of Diseases, Injuries, and Risk Factors Study 2017. We use the term CKD to refer to the morbidity and mortality that can be directly attributed to all stages of CKD, and we use the term impaired kidney function to refer to the additional risk of CKD from cardiovascular disease and gout.

Methods: The main data sources we used were published literature, vital registration systems, end-stage kidney disease registries, and household surveys. Estimates of CKD burden were produced using a Cause of Death Ensemble model and a Bayesian meta-regression analytical tool, and included incidence, prevalence, years lived with disability, mortality, years of life lost, and disability-adjusted life-years (DALYs). A comparative risk assessment approach was used to estimate the proportion of cardiovascular diseases and gout burden attributable to impaired kidney function.

Findings: Globally, in 2017, 1·2 million (95% uncertainty interval [UI] 1·2 to 1·3) people died from CKD. The global all-age mortality rate from CKD increased 41·5% (95% UI 35·2 to 46·5) between 1990 and 2017, although there was no significant change in the age-standardised mortality rate (2·8%, -1·5 to 6·3). In 2017, 697·5 million (95% UI 649·2 to 752·0) cases of all-stage CKD were recorded, for a global prevalence of 9·1% (8·5 to 9·8). The global all-age prevalence of CKD increased 29·3% (95% UI 26·4 to 32·6) since 1990, whereas the age-standardised prevalence remained stable (1·2%, -1·1 to 3·5). CKD resulted in 35·8 million (95% UI 33·7 to 38·0) DALYs in 2017, with diabetic nephropathy accounting for almost a third of DALYs. Most of the burden of CKD was concentrated in the three lowest quintiles of Socio-demographic Index (SDI). In several regions, particularly Oceania, sub-Saharan Africa, and Latin America, the burden of CKD was much higher than expected for the level of development, whereas the disease burden in western, eastern, and central sub-Saharan Africa, east Asia, south Asia, central and eastern Europe, Australasia, and western Europe was lower than expected. 1·4 million (95% UI 1·2 to 1·6) cardiovascular disease-related deaths and 25·3 million (22·2 to 28·9) cardiovascular disease DALYs were attributable to impaired kidney function.

Interpretation: Kidney disease has a major effect on global health, both as a direct cause of global morbidity and mortality and as an important risk factor for cardiovascular disease. CKD is largely preventable and treatable and deserves greater attention in global health policy decision making, particularly in locations with low and middle SDI.

Modifiable risk factors, cardiovascular disease, and mortality in 155 722 individuals from 21 high-income, middle-income, and low-income countries (PURE): a prospective cohort study
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Background: Global estimates of the effect of common modifiable risk factors on cardiovascular disease and mortality are largely based on data from separate studies, using different methodologies. The Prospective Urban Rural Epidemiology (PURE) study overcomes these limitations by using similar methods to prospectively measure the effect of modifiable risk factors on cardiovascular disease and mortality across 21 countries (spanning five continents) grouped by different economic levels.
Methods: In this multinational, prospective cohort study, we examined associations for 14 potentially modifiable risk factors with mortality and cardiovascular disease in 155 722 participants without a prior history of cardiovascular disease from 21 high-income, middle-income, or low-income countries (HICs, MICs, or LICs). The primary outcomes for this paper were composites of cardiovascular disease events (defined as cardiovascular death, myocardial infarction, stroke, and heart failure) and mortality. We describe the prevalence, hazard ratios (HRs), and population-attributable fractions (PAFs) for cardiovascular disease and mortality associated with a cluster of behavioural factors (ie, tobacco use, alcohol, diet, physical activity, and sodium intake), metabolic factors (ie, lipids, blood pressure, diabetes, obesity), socioeconomic and psychosocial factors (ie, education, symptoms of depression), grip strength, and household and ambient pollution. Associations between risk factors and the outcomes were established using multivariable Cox frailty models and using PAFs for the entire cohort, and also by countries grouped by income level. Associations are presented as HRs and PAFs with 95% CIs.
Findings: Between Jan 6, 2005, and Dec 4, 2016, 155 722 participants were enrolled and followed up for measurement of risk factors. 17 249 (11·1%) participants were from HICs, 102 680 (65·9%) were from MICs, and 35 793 (23·0%) from LICs. Approximately 70% of cardiovascular disease cases and deaths in the overall study population were attributed to modifiable risk factors. Metabolic factors were the predominant risk factors for cardiovascular disease (41·2% of the PAF), with hypertension being the largest (22·3% of the PAF). As a cluster, behavioural risk factors contributed most to deaths (26·3% of the PAF), although the single largest risk factor was a low education level (12·5% of the PAF). Ambient air pollution was associated with 13·9% of the PAF for cardiovascular disease, although different statistical methods were used for this analysis. In MICs and LICs, household air pollution, poor diet, low education, and low grip strength had stronger effects on cardiovascular disease or mortality than in HICs.
Interpretation: Most cardiovascular disease cases and deaths can be attributed to a small number of common, modifiable risk factors. While some factors have extensive global effects (eg, hypertension and education), others (eg, household air pollution and poor diet) vary by a country's economic level. Health policies should focus on risk factors that have the greatest effects on averting cardiovascular disease and death globally, with additional emphasis on risk factors of greatest importance in specific groups of countries.

The overweight and obesity transition from the wealthy to the poor in low- and middle-income countries: A survey of household data from 103 countries
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Background: In high-income countries, obesity prevalence (body mass index greater than or equal to 30 kg/m2) is highest among the poor, while overweight (body mass index greater than or equal to 25 kg/m2) is prevalent across all wealth groups. In contrast, in low-income countries, the prevalence of overweight and obesity is higher among wealthier individuals than among poorer individuals. We characterize the transition of overweight and obesity from wealthier to poorer populations as countries develop, and project the burden of overweight and obesity among the poor for 103 countries.

Methods and findings: Our sample used 182 Demographic and Health Surveys and World Health Surveys (n = 2.24 million respondents) from 1995 to 2016. We created a standard wealth index using household assets common among all surveys and linked national wealth by country and year identifiers. We then estimated the changing probability of overweight and obesity across every wealth decile as countries' per capita gross domestic product (GDP) rises using logistic and linear fixed-effect regression models. We found that obesity rates among the wealthiest decile were relatively stable with increasing national wealth, and the changing gradient was largely due to increasing obesity prevalence among poorer populations (3.5% [95% uncertainty interval: 0.0%–8.3%] to 14.3% [9.7%–19.0%]). Overweight prevalence among the richest (45.0% [35.6%–54.4%]) and the poorest (45.5% [35.9%–55.0%]) were roughly equal in high-income settings. At $8,000 GDP per capita, the adjusted probability of being obese was no longer highest in the richest decile, and the same was true of overweight at $10,000. Above $25,000, individuals in the richest decile were less likely than those in the poorest decile to be obese, and the same was true of overweight at $50,000. We then projected overweight and obesity rates by wealth decile to 2040 for all countries to quantify the expected rise in prevalence in the relatively poor. Our projections indicated that, if past trends continued, the number of people who are poor and overweight will increase in our study countries by a median 84.4% (range 3.54%–383.4%), most prominently in low-income countries. The main limitations of this study included the inclusion of cross-sectional, self-reported data, possible reverse causality of overweight and obesity on wealth, and the lack of physical activity and food price data.

Conclusions: Our findings indicate that as countries develop economically, overweight prevalence increased substantially among the poorest and stayed mostly unchanged among the wealthiest. The relative poor in upper- and lower-middle income countries may have the greatest burden, indicating important planning and targeting needs for national health programs.

Nutrition

Research
Impact of Feed the Future initiative on nutrition in children aged less than 5 years in sub-Saharan Africa: difference-in-differences analysis
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Objective. To evaluate the impact of the US government's Feed the Future initiative on nutrition outcomes in children younger than 5 years in sub-Saharan Africa.
Design. Difference-in-differences quasi-experimental approach.
Setting. Households in 33 low and lower middle income countries in sub-Saharan Africa.
Population 883 309 children aged less than 5 years with weight, height, and age recorded in 118 surveys conducted in 33 countries between 2000 and 2017: 388 052 children were from Feed the Future countries and 495 257 were from non-Feed the Future countries.
Main outcome measures A difference-in-differences approach was used to compare outcomes among children in intervention countries after implementation of the initiative with children before its introduction and children in non-intervention countries, controlling for relevant covariates, time invariant national differences, and time trends. The primary outcome was stunting (height for age >2 standard deviations below a reference median), a key indicator of undernutrition in children. Secondary outcomes were wasting (low weight for height) and underweight (low weight for age).
Results. Across all years and countries, 38.3% of children in the study sample were stunted, 8.9% showed wasting, and 21.3% were underweight. In the first six years of Feed the Future's implementation, children in 12 countries with the initiative exhibited a 3.9 percentage point (95% confidence interval 2.4 to 5.5) greater decline in stunting, a 1.1 percentage point (0.1 to 2.1) greater decline in wasting, and a 2.8 percentage point (1.6 to 4.0) greater decline in underweight levels compared with children in 21 countries without the initiative and compared with trends in undernutrition before Feed the Future was launched. These decreases translate to around two million fewer stunted and underweight children aged less than 5 years and around a half million fewer

children with wasting. For context, about 22 million children were stunted, 11 million children were underweight, and four million children were wasted in the Feed the Future countries at baseline. Conclusions. Feed the Future's activities were closely linked to notable improvements in stunting and underweight levels and moderate improvements in wasting in children younger than 5 years. These findings highlight the effectiveness of this large, country tailored initiative focused on agriculture and food security and have important implications for the future of this and other nutrition interventions worldwide.

21. Lancet 2020;395(10217):65-74

Dynamics of the double burden of malnutrition and the changing nutrition reality

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This is the first in a Series of four papers about the double burden of malnutrition.
The double burden of malnutrition (DBM), defined as the simultaneous manifestation of both undernutrition and overweight and obesity, affects most low-income and middle-income countries (LMICs). This Series paper describes the dynamics of the DBM in LMICs and how it differs by socioeconomic level. This Series paper shows that the DBM has increased in the poorest LMICs, mainly due to overweight and obesity increases. Indonesia is the largest country with a severe DBM, but many other Asian and sub-Saharan African countries also face this problem. We also discuss that overweight increases are mainly due to very rapid changes in the food system, particularly the availability of cheap ultra-processed food and beverages in LMICs, and major reductions in physical activity at work, transportation, home, and even leisure due to introductions of activity-saving technologies. Understanding that the lowest income LMICs face severe levels of the DBM and that the major direct cause is rapid increases in overweight allows identifying selected crucial drivers and possible options for addressing the DBM at all levels.

The other papers of the Series are:
Lancet 2020;395(10217):75-88
The double burden of malnutrition: aetiological pathways and consequences for health

Lancet 2020;395(10218):142-55
Double-duty actions: seizing programme and policy opportunities to address malnutrition in all its forms

Lancet 2020;395(10218):156-64
Economic effects of the double burden of malnutrition

Pharmaceuticals

22. HPP 2019;34(Issue Suppl_3):iii1-iii3

Access to medicines through health systems in low- and middle-income countries

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Nearly 2 billion people globally have no access to essential medicines. This means essential medicines are unavailable, unaffordable, inaccessible, unacceptable or of low quality for more than a quarter of the population worldwide. This supplement demonstrates the implications of poor medicine access and highlights recent innovations to improve access to essential medicines by presenting new research findings from low- and middle-income countries (LMICs). These studies answer key questions such as: Can performance-based financing improve availability of essential medicines? How affordable are cardiovascular treatments for children? Which countries' legal frameworks promote universal access to medicines? How appropriately are people using medicines? Do poor-quality medicines impact equity? Answers to these questions are important as essential medicines are vital to the Sustainable Development Goals and are central to the goal of achieving Universal Health Coverage. Access to

affordable, quality-assured essential medicines is crucial to reducing the financial burden of care, preventing greater pain and suffering, shortening the duration of illness, and averting needless disabilities and deaths worldwide. This supplement was organized by the Medicines in Health Systems Thematic Working Group of Health Systems Global, a membership organization dedicated to promoting health systems research and knowledge translation. The five studies in the supplement further our understanding by showcasing recent successes and challenges of improving access to quality-assured medicines through health systems in LMICs.

In the same supplement:
HPP 2019;34(Issue Suppl_3):iii48–iii57
Legislating for universal access to medicines: a rights-based cross-national comparison of UHC laws in 16 countries
Perehudoff SK, Hogerzeil HV. Department of Health Sciences, University Medical Center Groningen <katrina.perehudoff@gmail.com>

Public Health

Editorial
Making sense of emerging evidence on the non-specific effects of the BCG vaccine on malaria risk and neonatal mortality
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Vaccines are, indisputably, one of the greatest public health interventions, with a substantial positive impact on child survival. The remarkable declines in child mortality observed during the last quarter of a century, whereby global under 5 deaths were essentially halved, go hand in hand with the estimated 2–3 million child deaths prevented by vaccines annually. The premise for this is clear: vaccines directly prevent a variety of life-threatening diseases. Vaccines can also be held directly responsible for the eradication of smallpox, the first and only infectious disease extinguished by the action of humans and are paving the way for the disappearance of other terrible infections such as polio, measles or rubella.
In recent years, however, it has become increasingly clear that the impact of vaccines is achieved by their direct prevention against specific pathogens, and through a series of non-specific effects. These non-specific effects, also termed 'heterologous' effects, appear to be more common as a result of the vaccination with certain live-attenuated antigens (eg, the Bacillus Calmette-Guérin (BCG), measles or polio), and have been proposed for a wide variety of existing vaccines. Observational studies have pointed out to a longer-term all-cause mortality decrease attributable to having received those vaccines, independent of the target disease. Non-specific effects are understandably less tangible and less well-characterised than the direct ones, and therefore, remain a matter of significant debate and controversy.
To date, the nature of non-specific effects has not been fully elucidated, although the current thinking points to trained innate immunity as the main underlying mechanism. Trained immunity refers to an immunological memory of the innate response, a process in which certain stimuli induce epigenetic changes in the innate immune cells, increasing the response to the same and different subsequent stimuli. Vaccines with non-specific effects would induce reprogramming of the innate immune responses, a mechanism that clearly differs from the adaptive immunity induced by the antigen-specific responses to the vaccine. The uncertainty regarding their real added benefit calls for observational studies and clinical trials to help shed some more light on their true nature, and biological and immunological mechanisms.
Two studies published recently in BMJ Global Health are now providing further evidence of the non-specific effects of one live attenuated vaccine, namely BCG, ideally administered immediately after birth to protect against tuberculosis. Both articles appear to underscore malaria (and its deleterious

direct effect during infancy, or indirect one when acquired during the mother's pregnancy) at the core of the preventative immunomodulatory non-specific effects conferred by the BCG vaccine.

Original research
Seasonal variation in the non-specific effects of BCG vaccination on neonatal mortality: three randomised controlled trials in Guinea-Bissau
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The BCG vaccine protects non-specifically against other diseases than tuberculosis. Three randomised controlled trials of early BCG in Guinea-Bissau found a 38% reduction in all-cause neonatal mortality. Little is known about the underlying mechanisms. In Guinea-Bissau, prevalent infectious diseases display distinct seasonality. Revisiting the three trials (>6500 infants) comparing early BCG versus no early BCG in low weight infants on all-cause neonatal mortality over 12 consecutive years, we explored the seasonal variation in BCG's effect on mortality. In a subgroup of participants, adaptive and innate cytokine responses were measured 4 weeks after randomisation. Consistently over the course of the three trials and 12 years, the effect of BCG on all-cause neonatal mortality was particularly beneficial when administered in November to January, coincident with peaking malaria infections. During these months, BCG was also associated with stronger proinflammatory responses to heterologous challenge. Recent studies have suggested a protective effect of BCG against malaria. BCG may also ameliorate immune-compromising fatal effects of placental malaria in the newborn.

Disrespectful treatment in primary care in rural Tanzania: beyond any single health issue
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Knowing how patients are treated in care is foundational for creating patient-centred, high-quality health systems and identifying areas where policies and practices need to adapt to improve patient care. However, little is known about the prevalence of disrespectful treatment of patients in sub-Saharan Africa outside of maternity care. We used data from a household survey of 2002 women living in rural Tanzania to describe the extent of disrespectful care during outpatient visits, who receive disrespectful care, and determine the association with patient satisfaction, rating of quality and recommendation of the facility to others. We asked about women's most recent outpatient visit to the local clinic, including if they were made to feel disrespected, if a provider shouted at or scolded them, and if providers made negative or disparaging comments about them. Women who answered yes to any of these questions were considered to have experienced disrespectful care. We report risk ratios with standard errors clustered at the facility level. The most common reasons for seeking care were fever or malaria (33.9%), vaccination (33.6%) and non-emergent check-up (13.4%). Disrespectful care was reported by 14.3% of women and was more likely if the visit was for sickness compared to a routine check-up [risk ratio (RR): 1.6, 95% confidence interval (CI): 1.1–2.2]. Women who did not report disrespectful care were 2.1 times as likely to recommend the clinic (95% CI: 1.6–2.7). While there is currently a lot of attention on disrespectful maternity care, our results suggest that this is a problem that goes beyond this single health issue

How to do (or not to do) … using the standardized patient method to measure clinical quality of care in LMIC health facilities
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Standardized patients (SPs), i.e. mystery shoppers for healthcare providers, are increasingly used as a tool to measure quality of clinical care, particularly in low- and middle-income countries where medical record abstraction is unlikely to be feasible. The SP method allows care to be observed

without the provider's knowledge, removing concerns about the Hawthorne effect, and means that providers can be directly compared against each other. However, their undercover nature means that there are methodological and ethical challenges beyond those found in normal fieldwork. We draw on a systematic review and our own experience of implementing such studies to discuss six key steps in designing and executing SP studies in healthcare facilities, which are more complex than those in retail settings. Researchers must carefully choose the symptoms or conditions the SPs will present in order to minimize potential harm to fieldworkers, reduce the risk of detection and ensure that there is a meaningful measure of clinical care. They must carefully define the types of outcomes to be documented, develop the study scripts and questionnaires, and adopt an appropriate sampling strategy. Particular attention is required to ethical considerations and to assessing detection by providers. Such studies require thorough planning, piloting and training, and a dedicated and engaged field team. With sufficient effort, SP studies can provide uniquely rich data, giving insights into how care is provided which is of great value to both researchers and policymakers.

27. HHP 2020;35(1):91-101
Review: Expanding the use of community health workers in urban settings: a potential strategy for progress towards universal health coverage
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Community health worker (CHW) programmes have been used for decades to improve access to health services in rural settings in low- and middle-income countries. With more than half of the world's population currently living in urban areas and this population expected to grow, equitable access to health services in urban areas is critically important. To understand the extent to which CHW programmes have been successfully deployed in low-income urban settings, we conducted a review of the literature between 2000 and 2018 to identify studies evaluating and describing CHW programmes implemented fully or partially in urban or peri-urban settings. We identified 32 peer-reviewed articles that met our inclusion criteria. Benefits have been documented in several urban settings in low- and middle-income countries including those to address TB/HIV, child health, maternal health and non-communicable diseases through a variety of study designs.

28. HPP 2020;35(2):133-41
The differential impacts of PEPFAR transition on private for-profit, private not-for-profit and publicly owned health facilities in Uganda
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While transition of donor programs to national control is increasingly common, there is a lack of evidence about the consequences of transition for private health care providers. In 2015, President's Emergency Plan for AIDS Relief (PEPFAR) identified 734 facilities in Uganda for transition from PEPFAR support, including 137 private not-for-profits (PNFP) and 140 private for-profits (PFPs). Under the PEPFAR Geographical Priorization policy, these facilities were expected to lose site-level support for supervision, training and on-site laboratories, outreach and health worker incentives, but retain above-site support through commodity supply chains and laboratory hubs. We sought to understand the differential impacts of transition on facilities with differing ownership statuses. We used a survey conducted in mid-2017 among 145 public, 29 PNFP and 32 PFP facilities reporting transition from PEPFAR. The survey collected information on current and prior PEPFAR support, service provision, laboratory services and staff time allocation. We used both bivariate and logistic regression to analyse the association between ownership and survey responses. All analyses adjust for survey design. Public facilities were more likely to report increased disruption of sputum microscopy tests following transition than PFPs [odds ratio (OR) = 5.85, 1.79–19.23, $P = 0.005$]. Compared with public facilities, PNFPs were more likely to report declining frequency of supervision for human immunodeficiency virus (HIV) since transition (OR = 2.27, 1.136–4.518, $P = 0.022$). Workers in PFP facilities were more likely to report reduced time spent on HIV care since transition (OR = 6.241, 2.709–14.38, $P < 0.001$), and PFP facilities were also more likely to discontinue HIV outreach following transition (OR = 3.029, 1.325–6.925; $P = 0.011$). PNFP facilities' loss of supervision may

require that public sector supervision be extended to them. Reduced HIV clinical care in PFPs, primarily HIV testing and counselling, increases burdens on public facilities. Prior PFP clients who preferred the confidentiality and service of private facilities may opt to forgo HIV testing altogether. Donors and governments should consider the roles and responses of PNFPs and PFPs when transitioning donor-funded health programs.

Factors influencing the scale-up of public health interventions in low- and middle-income countries: a qualitative systematic literature review
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To achieve universal health coverage, the scale-up of high impact public health interventions is essential. However, scale-up is challenging and often not successful. Therefore, a systematic review was conducted to provide insights into the factors influencing the scale-up of public health interventions in low- and middle-income countries (LMICs). Two databases were searched for studies with a qualitative research component. The GRADE-CERQual approach was applied to assess the confidence in the evidence for each key review finding. A multi-level perspective on transition was applied to ensure a focus on vertical scale-up for sustainability. According to this theory, changes in the way of organizing (structure), doing (practice) and thinking (culture) need to take place to ensure the scale-up of an intervention. Among the most prominent factors influencing scale-up through changes in structure was the availability of financial, human and material resources. Inadequate supply chains were often barriers to scale-up. Advocacy activities positively influenced scale-up, and changes in the policy environment hindered or facilitated scale-up. The most outstanding factors influencing scale-up through changes in practice were the availability of a strategic plan for scale-up and the way in which training and supervision was conducted. Furthermore, collaborations such as community participation and partnerships facilitated scale-up, as well as the availability of research and monitoring and evaluation data. Factors influencing scale-up through a change in culture were less prominent in the literature. While some studies articulated the acceptability of the intervention in a given sociocultural environment, more emphasis was placed on the importance of stakeholders feeling a need for a specific intervention to facilitate its scale-up. All identified factors should be taken into account when scaling up public health interventions in LMICs. The different factors are strongly interlinked, and most of them are related to one crucial first step: the development of a scale-up strategy before scaling up.

The Neglected Hospital — The District Hospital's Central Role in Global Health Care Delivery
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Although HIV remains an important contributor to the global disease burden, during the past decade great strides have been made in addressing this epidemic. The global health agenda has now begun to include improving delivery of surgical and non-communicable-disease services in low- and lower-middle-income countries (LLMICs). In addition, renewed calls to implement and extend universal health coverage in these settings have raised the issue of quality improvement, as policymakers strive to increase the value of covered services. Advancing emerging surgery, non-communicable-disease, and quality agendas will be possible only if investments are aimed at strengthening a perennially undervalued component of health systems in LLMICs: the district hospital.
For people living in these countries, particularly in rural communities, the district hospital is a central hub for higher-level clinical care. District hospitals are often located in a district's capital and can be a central location for medical referrals; training of health workers, including clinical assistants and nurses; supervision of peripheral facilities; and public health surveillance. Such hospitals are generally 50- to 200- bed institutions that provide care for a district's 100,000 to 1 million people.
District hospitals should be recognized as a crucial piece of the primary health care puzzle, serving both as a platform for treatment programs for various diseases and as the hub of a robust referral

network of community health workers and lower level facilities. We believe that increased investment in hospital based care is a necessary and cost-effective step toward advancing universal health coverage and strengthening health systems in LLMICs. The improvement of district hospitals is a prerequisite for any advancement of the global agendas for non-communicable diseases, surgery, and quality of care.

Editorial
Strengthening our knowledge base and research capacity for improved adolescent health in sub-Saharan Africa: a South-South-North collaboration

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The Global Strategy calls for 'global and national research networks, knowledge platforms and data hubs to provide accurate, timely and transparent evidence, knowledge, data analysis and synthesis', on adolescence and health. With the Adolescent Health Study, the ARISE Network–a network of 21 research institutions from nine countries in sub-Saharan Africa–followed this call. The over-arching goal of this study was to guide local interventions that can address structural, behavioural and biological health risks among adolescents. The study currently includes nine communities, of which six have existing Health and Demographic Surveillance Systems (HDSSs).

This issue of Tropical Medicine & International Health contains 12 research papers using data from the ARISE Network Adolescent Health Study. The first two papers describe the methods used for the study and the prevalence of key risk factors across communities and domains. Three papers explore adolescent risk behaviours across communities in detail: nutrition, sexual and reproductive health knowledge, and depressive symptoms and suicidal ideation. One paper describes correlations between school enrolment and health risks. Six papers focus on particular adolescent health domains in single communities or countries, including sexual behaviour in Uganda; malnutrition in Tanzania; adolescent stunting and HIV-related practices in Ethiopia; and female genital cutting and eating disorders in Burkina Faso. Findings from these papers describe diverse, complex and context-specific health needs among adolescent populations. Taken together, these papers paint a picture of the adolescent health landscape in these sub-Saharan African communities and highlight the need for future research. In particular, intervention studies are needed to improve health promotion and disease prevention among adolescents and to influence health outcomes across the life course.

1. Design and field methods of the ARISE Network Adolescent Health Study
2. The age of opportunity: prevalence of key risk factors among adolescents 10–19 years of age in nine communities in sub-Saharan Africa
3. Gender differences in nutritional status, diet and physical activity among adolescents in eight countries in sub-Saharan Africa
4. Sexual and reproductive health knowledge among adolescents in eight sites across sub-Saharan Africa
5. Factors associated with depressive symptoms and suicidal ideation and behaviours amongst sub-Saharan African adolescents aged 10-19 years: cross-sectional study
6. Are out-of-school adolescents at higher risk of adverse health outcomes? Evidence from 9 diverse settings in sub-Saharan Africa
7. Sexual behaviours among adolescents in a rural setting in eastern Uganda: a cross-sectional study
8. Prevalence and risk factors associated with malnutrition among adolescents in rural Tanzania
9. Prevalence and predictors of adolescent linear growth and stunting across the urban–rural gradient in eastern Ethiopia
10. HIV/AIDS awareness and testing practices among adolescents in eastern Ethiopia
11. Attitudes towards female genital cutting among adolescents in rural Burkina Faso: a multilevel analysis
12. Eating disorders, body image and media exposure among adolescent girls in rural Burkina Faso

32. BMJ GH 2020;5(3):e002135
Original research
Toward improving respectful maternity care: a discrete choice experiment with rural women in northeast Nigeria
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Introduction. There is a limited understanding of the importance of respectful maternity care on utilisation of maternal and newborn health services. This study aimed to determine how specific hypothetical facility birth experience of care attributes influenced rural Nigerian women's stated preferences for hypothetical place of delivery.
Methods. Attributes were identified through a comprehensive review of the literature. These attributes and their respective levels were further investigated in a qualitative study. We then developed and implemented a cross-sectional discrete choice experiment with a random sample of 426 women who had facility-based childbirth to elicit their stated preferences for facility birth experience of care attributes. Women were asked to choose between two hypothetical health facilities or home birth for future delivery. Choice data were analysed using multinomial logit and mixed multinomial logit models.
Results. Complete data for the discrete choice experiment were available for 425 of 426 women. The majority belonged to Fulani ethnic group (60%) and were married (95%). Almost half (45%) had no formal education. Parameter estimates were all of expected signs suggesting internal validity. The most important influence on choice of place of delivery was good health system condition, followed by absence of sexual abuse, then absence of physical and verbal abuse. Poor facility culture, including an unclean birth environment with no privacy and unclear user fee, was associated with the most disutility and had the most negative impact on preferences for facility-based childbirth.
Conclusion . he likelihood of poor facility birth experiences had a significant impact on stated preferences for place of delivery among rural women in northeast Nigeria. The study findings further underline the important relationship between facility birth experience and utilisation. Achieving universal health coverage would require efforts toward addressing poor facility birth experiences and promoting respectful maternity care, to ensure women want to access the services available.

33. BMJ GH 2020;5(3):e001915
Original research
What the percentage of births in facilities does not measure: readiness for emergency obstetric care and referral in Senegal
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Introduction. Increases in facility deliveries in sub-Saharan Africa have not yielded expected declines in maternal mortality, raising concerns about the quality of care provided in facilities. The readiness of facilities at different health system levels to provide both emergency obstetric and newborn care (EmONC) as well as referral is unknown. We describe this combined readiness by facility level and region in Senegal.
Methods. For this cross-sectional study, we used data from nine Demographic and Health Surveys between 1992 and 2017 in Senegal to describe trends in location of births over time. We used data from the 2017 Service Provision Assessment to describe EmONC and emergency referral readiness across facility levels in the public system, where 94% of facility births occur. A national global positioning system facility census was used to map access from lower-level facilities to the nearest facility performing caesareans.
Results. Births in facilities increased from 47% in 1992 to 80% in 2016, driven by births in lower-level health posts, where half of facility births now occur. Caesarean rates in rural areas more than doubled but only to 3.7%, indicating minor improvements in EmONC access. Only 9% of health posts had full readiness for basic EmONC, and 62% had adequate referral readiness (vehicle on-site or

telephone and vehicle access elsewhere). Although public facilities accounted for three-quarters of all births in 2016, only 16% of such births occurred in facilities able to provide adequate combined readiness for EmONC and referral.

Conclusions. Our findings imply that many lower-level public facilities—the most common place of birth in Senegal—are unable to treat or refer women with obstetric complications, especially in rural areas. In light of rising lower-level facility births in Senegal and elsewhere, improvements in EmONC and referral readiness are urgently needed to accelerate reductions in maternal and perinatal mortality.

Assessing the role of women's autonomy and acceptability of intimate-partner violence in maternal health-care utilization in 63 low- and middle-income countries
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Background. Our study investigates the associations between women's autonomy and attitudes toward the acceptability of intimate-partner violence against women (IPVAW) and maternal health-care utilization outcomes.

Methods. We combine data from 113 Demographic and Health Surveys conducted between 2003 and 2016, which give us a pooled sample of 765 169 mothers and 777 352 births from 63 countries. We generate composite scores of women's autonomy (six-point scale with reference: no contribution) and acceptability of IPVAW (five-point scale with reference: no acceptance) and assess the associations between these measures and women's use of antenatal care services and facility delivery in pooled and unique country samples.

Results. A change in a woman's autonomy score from 'no contribution to any decision-making domain' (a composite autonomy score of 0) to 'contribution to all decision-making domains' (a score of 6) is associated with a 31.2% increase in her odds of delivering in a facility and a 42.4% increase in her odds of receiving at least eight antenatal care visits over the course of her pregnancy. In contrast, a change in a woman's attitude towards acceptability of IPVAW from 'IPVAW is not acceptable under any scenario' (a score of 0) to 'IPVAW is acceptable in all scenarios' (a score of 5) is associated with an 8.9% decrease in her odds of delivering in a facility and a 20.3% decrease in her odds of receiving eight antenatal care visits.

Conclusions. Our findings suggest that strong and significant associations exist between autonomy, acceptability of IPVAW and utilization of maternal health-care services.

Female Genital Schistosomiasis
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Female genital schistosomiasis is a common complication of Schistosoma haematobium parasitism. Many experts believe that praziquantel for FGS prevention should be added to HPV and HIV preventive measures to promote sexual and reproductive health in African women.

Promotion of universal health coverage, in line with the United Nations' Sustainable Development Goals, has focused global attention on sexual and reproductive health and rights and their impact on the overall health, safety, and equality of women, especially those who live in extreme poverty. Today, hundreds of millions of African women lack access to adequate sexual and reproductive health services, including HIV/AIDS prevention and cervical cancer prevention. But there are other important threats to sexual and reproductive health, such as female genital schistosomiasis (FGS). Schistosomiasis affects at least 120 million people on the African continent, approximately two thirds of whom have the urinary tract form caused by Schistosoma haematobium. Schistosomiasis is acquired through contact with fresh water contaminated with larval helminths, known as cercariae, which are produced by intermediate snail hosts of the parasite. For centuries, chronic S. haematobium infection in Africa has caused hematuria and serious urinary tract sequelae, including hydronephrosis, renal failure, and bladder cancer due to the presence of schistosome eggs in the bladder and a vigorous inflammatory response in the human host. Beginning in the mid-20th century, clinical reports of schistosomiasis of the cervix began to emerge, followed by full descriptions of FGS based on

colposcopic examination and microscopy of genital biopsies that revealed S. haematobium eggs in the cervix, vagina, and vulva. Girls and women with FGS present with genital sandy patches ("rubbery papules" or yellow sandy areas composed of schistosome eggs and host eosinophilic inflammatory tissue) that cause contact and postcoital bleeding, genital itch, abnormal discharge, stress incontinence, and dyspareunia, leading to infertility in the longer term.

Today, FGS is recognized as a common complication of S. haematobium parasitism, occurring in approximately half (33 to 75%) of infected females, or roughly 40 million girls and women. It is thus one of the most common gynecologic conditions in Africa.

A package of sexual and reproductive health interventions would address the three overlapping health challenges. Lack of access to praziquantel, the social stigma associated with FGS, and the failure to consider FGS as a central element of sexual and reproductive health have emerged as important social justice issues for the girls and women of Africa. We now have the tools and technical ability to prevent FGS, HIV/ AIDS, and cervical cancer simultaneously.

Maternal exposure to intimate partner violence and breastfeeding practices in 51 low-income and middle-income countries: A population-based cross-sectional study
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Background: Intimate partner violence (IPV) against women is a major global health issue, particularly in low- and middle-income countries (LMICs), that is associated with poor physical and mental health, but its association with breastfeeding practices is understudied. Both the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that children initiate breastfeeding within the first hour of birth and be exclusively breastfed for the first 6 months of life. Breastfeeding within the first hour of birth is critical to newborn survival, and exclusive breastfeeding for 6 months is recognised to offer significant health benefits to mothers and their infants. We examined the association of maternal exposure to IPV with early initiation of breastfeeding (within 1 hour of birth) and exclusive breastfeeding in the first 6 months.

Methods and findings: We assessed population-based cross-sectional Demographic and Health Surveys (DHS) from 51 LMICs. Data from the most recent DHS in each country (conducted between January 2000 and January 2019) with data available on IPV and breastfeeding practices were used. By WHO region, 52.9% (27/51) were from Africa, 11.8% (6/51) from the Americas, 7.8% (4/51) from the Eastern Mediterranean, 11.8% (6/51) from Europe, 11.8% (6/51) from South-East Asia, and 3.9% (2/51) from the Western Pacific. We estimated multilevel logistic regression models for any IPV and each type of IPV separately (physical violence, sexual violence, and emotional violence), accounting for demographic and socioeconomic factors. Depending on specification, the sample size varied between 95,320 and 102,318 mother–infant dyads. The mean age of mothers was 27.5 years, and the prevalence of any lifetime exposure to IPV among mothers was 33.3% (27.6% for physical violence, 8.4% for sexual violence, and 16.4% for emotional violence). Mothers exposed to any IPV were less likely to initiate breastfeeding early (adjusted odds ratio [AOR]: 0.88 [95% CI 0.85–0.97], $p < 0.001$) and breastfeed exclusively in the first 6 months (AOR: 0.87 [95% CI 0.82–0.92], $p < 0.001$). The associations were similar for each type of IPV and were overall consistent across infant's sex and WHO regions. After simultaneously adjusting for all 3 types of IPV, all 3 types of IPV were independently associated with decreased likelihood of early breastfeeding initiation, but only exposure to physical violence was independently associated with a decreased likelihood of exclusively breastfeeding in the first 6 months. The main limitations of this study included the use of cross-sectional datasets, the possibility of residual confounding of the observed associations by household wealth, and the possibility of underreporting of IPV experiences attenuating the magnitude of observed associations.

Conclusions: Our study indicates that mothers exposed to any form of IPV (physical, sexual, or emotional violence) were less likely to initiate breastfeeding early and breastfeed exclusively in the first 6 months. These findings may inform the argument for antenatal screening for IPV in LMICs and the provision of services to not only improve mothers' safety and well-being, but also support them in adopting recommended breastfeeding practices.

Provision of postpartum care to women giving birth in health facilities in sub-Saharan Africa: A cross-sectional study using Demographic and Health Survey data from 33 countries
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Background: Postpartum care has the potential to avert a substantial proportion of maternal and perinatal mortality and morbidity. There is a crucial gap in understanding the quality of postpartum care for women giving birth in health facilities in low- and middle-income settings. This is particularly the case in sub-Saharan Africa (SSA), where the levels of maternal and neonatal mortality are highest globally despite rapid increases in facility-based childbirth. This study estimated the percentage of women receiving a postpartum health check following childbirth in a health facility in SSA and examined the determinants of receiving such check.
Methods and findings: We used the most recent Demographic and Health Survey (DHS) conducted in 33 SSA countries between 2000–2016. We estimated the percentage of women receiving a postpartum check by a health professional while in the childbirth facility and the associated 95% confidence interval (CI) for each country. We analyzed determinants of receiving such checks using logistic regression of the pooled data. The analysis sample included 137,218 women whose most recent live birth in the 5- year period before the survey took place in a health facility. Of this pooled sample, 65.7% of women were under 30 years of age, 85.9% were currently married, and 57% resided in rural areas. Across countries, the median percentage of women who reported receiving a check was 71.7%, ranging from 26.6% in Eswatini (Swaziland) to 94.4% in Burkina Faso. The most fully adjusted model showed that factors from all four conceptual categories (obstetric/neonatal risk factors, care environment, and women's sociodemographic and child-related characteristics) were significant determinants of receiving a check. Women with a cesarean section had a significantly higher adjusted odds ratio (aOR) of 1.88 (95% CI 1.72–2.05, p < 0.001) of receiving a check. Women giving birth in lower-level public facilities had lower odds of receiving a check (aOR 0.94, 95% CI 0.90–0.98, p = 0.002) compared to those in public hospitals, as did women attended by a nurse/midwife (compared to doctor/nonphysician clinician) (aOR 0.74, 95% CI 0.69–0.78, p < 0.001). This study was limited by the accuracy of the respondent's recall of the provider, timing, and receipt of postpartum checks. The outcome of interest was measured using three slightly different question sets across the 33 included countries.
Conclusions: The suboptimal levels of postpartum checks in health facilities in many of the included SSA countries partially reflect the lack of importance given to postpartum care in the global discourse on essential interventions and quality improvement in maternal health. Addressing disparities in access to both facility-based childbirth and good-quality postpartum care in SSA is critical to addressing stalling declines in maternal mortality and morbidity.

Mortality impact of achieving WHO cervical cancer elimination targets: a comparative modelling analysis in 78 low-income and lower-middle-income countries
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Background: WHO is developing a global strategy towards eliminating cervical cancer as a public health problem, which proposes an elimination threshold of four cases per 100 000 women and includes 2030 triple-intervention coverage targets for scale-up of human papillomavirus (HPV) vaccination to 90%, twice-lifetime cervical screening to 70%, and treatment of pre-invasive lesions and invasive cancer to 90%. We assessed the impact of achieving the 90-70-90 triple-intervention targets on cervical cancer mortality and deaths averted over the next century. We also assessed the potential for the elimination initiative to support target 3.4 of the UN Sustainable Development Goals (SDGs)-a one-third reduction in premature mortality from non-communicable diseases by 2030.
Methods: The WHO Cervical Cancer Elimination Modelling Consortium (CCEMC) involves three independent, dynamic models of HPV infection, cervical carcinogenesis, screening, and precancer and

invasive cancer treatment. Reductions in age-standardised rates of cervical cancer mortality in 78 low-income and lower-middle-income countries (LMICs) were estimated for three core scenarios: girls-only vaccination at age 9 years with catch-up for girls aged 10-14 years; girls-only vaccination plus once-lifetime screening and cancer treatment scale-up; and girls-only vaccination plus twice-lifetime screening and cancer treatment scale-up. Vaccination was assumed to provide 100% lifetime protection against infections with HPV types 16, 18, 31, 33, 45, 52, and 58, and to scale up to 90% coverage in 2020. Cervical screening involved HPV testing at age 35 years, or at ages 35 years and 45 years, with scale-up to 45% coverage by 2023, 70% by 2030, and 90% by 2045, and we assumed that 50% of women with invasive cervical cancer would receive appropriate surgery, radiotherapy, and chemotherapy by 2023, which would increase to 90% by 2030. We summarised results using the median (range) of model predictions. FINDINGS: In 2020, the estimated cervical cancer mortality rate across all 78 LMICs was 13·2 (range 12·9-14·1) per 100 000 women. Compared to the status quo, by 2030, vaccination alone would have minimal impact on cervical cancer mortality, leading to a 0·1% (0·1-0·5) reduction, but additionally scaling up twice-lifetime screening and cancer treatment would reduce mortality by 34·2% (23·3-37·8), averting 300 000 (300 000-400 000) deaths by 2030 (with similar results for once-lifetime screening). By 2070, scaling up vaccination alone would reduce mortality by 61·7% (61·4-66·1), averting 4·8 million (4·1-4·8) deaths. By 2070, additionally scaling up screening and cancer treatment would reduce mortality by 88·9% (84·0-89·3), averting 13·3 million (13·1-13·6) deaths (with once-lifetime screening), or by 92·3% (88·4-93·0), averting 14·6 million (14·1-14·6) deaths (with twice-lifetime screening). By 2120, vaccination alone would reduce mortality by 89·5% (86·6-89·9), averting 45·8 million (44·7-46·4) deaths. By 2120, additionally scaling up screening and cancer treatment would reduce mortality by 97·9% (95·0-98·0), averting 60·8 million (60·2-61·2) deaths (with once-lifetime screening), or by 98·6% (96·5-98·6), averting 62·6 million (62·1-62·8) deaths (with twice-lifetime screening). With the WHO triple-intervention strategy, over the next 10 years, about half (48% [45-55]) of deaths averted would be in sub-Saharan Africa and almost a third (32% [29-34]) would be in South Asia; over the next 100 years, almost 90% of deaths averted would be in these regions. For premature deaths (age 30-69 years), the WHO triple-intervention strategy would result in rate reductions of 33·9% (24·4-37·9) by 2030, 96·2% (94·3-96·8) by 2070, and 98·6% (96·9-98·8) by 2120. INTERPRETATION: These findings emphasise the importance of acting immediately on three fronts to scale up vaccination, screening, and treatment for pre-invasive and invasive cervical cancer. In the next 10 years, a one-third reduction in the rate of premature mortality from cervical cancer in LMICs is possible, contributing to the realisation of the 2030 UN SDGs. Over the next century, successful implementation of the WHO elimination strategy would reduce cervical cancer mortality by almost 99% and save more than 62 million women's lives.

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Acceptability and safety of thermal ablation for the treatment of precancerous cervical lesions in Honduras
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Objective: To evaluate the acceptability and safety of thermal ablation (TA) for the treatment of precancerous cervical lesions in women in Honduras.
Methods: Human papillomavirus (HPV) and visual inspection with acetic acid (VIA) screen-positive eligible women received TA. After treatment, women rated the level of pain experienced during treatment using the Wong-Baker FACES® pain-rating scale from 0 to 10. Short-term safety outcomes that could require medical attention were assessed one month after treatment.
Results: A total of 319 women received TA treatment. The average pain rating was 2.5 (95% CI: 2.3-2.8), and 85% rated their pain levels as less than 6. No significant differences in low (below 6) or high (6 and above) pain were found by age or number of biopsies performed, but there was a significant difference by the number of TA applications (P < 0.01). When asked if they would recommend this treatment, all women said they would. At the one-month follow-up visit, the most common reported discomforts were bleeding (10%) and cramping (8.4%); 11 women reported severe lower abdominal pain, and none required medical attention.
Conclusions: TA is safe and acceptable to patients as a treatment option for precancerous cervical lesions in low-resource settings.

Antenatal care and skilled delivery service utilisation in Somali pastoral communities of Eastern Ethiopia

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Objective: To assess maternal health care service utilisation and associated factors in Somali pastoral communities of eastern Ethiopia.

Methods: Community-based cross-sectional study complemented by qualitative assessments in Adadle district, Somali region, eastern Ethiopia, among 450 women in six kebeles from August to September 2016. Logistic regression was used to assess factors associated with antenatal care use and skilled delivery care use, controlling for confounders.

Results: About 27% [95%CI 22.8-31.2%] of women used antenatal care, and 22.6% [95%CI 18.7-26.5%] received skilled delivery service. None of the respondents reported post-natal care. About 43% reported that they had no knowledge of antenatal care, and 46% did not perceive delivery at a health facility as important. Pastoral lifestyle, husband's educational status, women's attitude towards health care service and financial support from the husband were significantly associated with antenatal care utilisation. Health professionals' attitudes, perceptions of institutional delivery, antenatal care utilisation and information about exemptions from maternal health care fees were associated with skilled delivery service utilisation.

Conclusion: Improving community awareness of antenatal care, employing female health professionals and culturally adapted guidelines could improve skilled delivery utilisation. In a patriarchal society, involving male partners in all maternal health issues is essential to increase use of maternal health services and to decrease maternal mortality.

Miscellaneous

Corruption in Anglophone West Africa health systems: a systematic review of its different variants and the factors that sustain them

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West African countries are ranked especially low in global corruption perception indexes. The health sector is often singled out for particular concern given the role of corruption in hampering access to, and utilization of health services, representing a major barrier to progress to universal health coverage and to achieving the health-related Sustainable Development Goals. The first step in tackling corruption systematically is to understand its scale and nature. We present a systematic review of literature that explores corruption involving front-line healthcare providers, their managers and other stakeholders in health sectors in the five Anglophone West African (AWA) countries: Gambia, Ghana, Liberia, Nigeria and Sierra Leone, identifying motivators and drivers of corrupt practices and interventions that have been adopted or proposed. Boolean operators were adopted to optimize search outputs and identify relevant studies. Both grey and published literature were identified from Research Gate, Yahoo, Google Scholar, Google and PubMed, and reviewed and synthesized around key domains, with 61 publications meeting our inclusion criteria. The top five most prevalent/frequently reported corrupt practices were (1) absenteeism; (2) diversion of patients to private facilities; (3) inappropriate procurement; (4) informal payments; and (5) theft of drugs and supplies. Incentives for corrupt practices and other manifestations of corruption in the AWA health sector were also highlighted, while poor working conditions and low wages fuel malpractice. Primary research on anti-corruption strategies in health sectors in AWA remains scarce, with recommendations to curb corrupt practices often drawn from personal views and experience rather that of rigorous studies. We argue that a nuanced understanding of all types of corruption and their impacts is an important precondition to designing viable contextually appropriate anti-corruption strategies. It is a particular challenge to identify and tackle corruption in settings where formal rules are fluid or insufficiently enforced.