International Health Alerts 2019-2 Contents

23. TMIH 2019;24(6):701-14
Programmatic outcomes and impact of rapid public sector antiretroviral therapy expansion in adults prior to introduction of the WHO treat-all approach in rural Eswatini

Malaria

24. BMJ 2019;365:l2216
Editorials
Malaria control stalls in high incidence areas

25. TMIH 2019;24(6):747-56
Outcomes of patients lost to follow-up after antiretroviral therapy initiation in rural north-eastern South Africa

26. TMIH 2019;24(6):775-85
Growth in the first 5 years after antiretroviral therapy initiation among HIV-infected children in the IeDEA West African Pediatric Cohort

27. Am J Trop Med Hyg. 2019 Mar;100(3):566-571. doi: 10.4269/ajtmh.18-0496.
Use of Loop-Mediated Isothermal Amplification in a Resource-Saving Strategy for Primary Malaria Screening in a Non-Endemic Setting.

28. Am J Trop Med Hyg. 2019 Apr;100(4):861-867. doi: 10.4269/ajtmh.18-0362.
Perspectives on Implementation Considerations and Costs of Malaria Case Management Supportive Supervision.

29. Lancet. 2019 Jun 19. pii: S0140-6736(19)31097-9. doi: 10.1016/S0140-6736(19)31097-9. [Epub ahead of print]
Mapping the global prevalence, incidence, and mortality of Plasmodium falciparum, 2000-17: a spatial and temporal modelling study.

30. N Engl J Med 2019; 380:2087-2089
Perspective: A Temporizing Solution to "Artemisinin Resistance"

Medicines

31. Am J Trop Med Hyg. 2019 May;100(5):1058-1065. doi: 10.4269/ajtmh.18-0981.
Falsified and Substandard Drugs: Stopping the Pandemic.

32. N Engl J Med 2019; 380:2389-2391
Perspective: Collateral Benefits of Preventive Chemotherapy — Expanding the War on Neglected Tropical Diseases

Non Communicable Diseases

33. Lancet 2019;393(10185):2039-50
Effects, equity, and cost of school-based and community-wide treatment strategies for soil-transmitted helminths in Kenya: a cluster-randomised controlled trial

34. Health Policy and Planning, 34, 2019 (1): 55–66
Combating non-communicable diseases: potentials and challenges for community health workers in a digital age, a narrative review of the literature

Sexual and Reproductive Health

35. BMJ 2019;365:l4124
News
WHO reports "concerning lack of progress" in stopping STI spread

36. Bmjgh 2019-001389
Research
Does voluntary medical circumcision protect against sexual transmitted infections among men and women in real-world scape-up settings? Findings of a household survey in KwaZulu-Natal, South Africa

37. bmjgh-2019-001452
Research
The role of community health workers in cervical cancer screening in low-income and middle-income countries: a systematic scoping review of the literature

38. TMIH 2019;24(5):553-62
Women's recommendations: vacuum extraction or caesarean section for prolonged second stage of labour, a prospective cohort study in Uganda

39. TMIH 2019;24(5):636-46
Effect of a maternal and newborn health system quality improvement project on the use of facilities for childbirth: a cluster-randomised study in rural Tanzania

40. International Journal of Epidemiology, 2019, Vol 48 (2): 423–432
Poor diet quality in pregnancy is associated with increased risk of excess fetal growth: a prospective multi-racial/ethnic cohort study

Miscellaneous

41. BMJ 2019;365:l2255
Letters Patients and open access
Open access: remember doctors in developing countries

42 BMJ 2019;365:l2287
Research
Impact of the WHO Framework Convention on Tobacco Control on global cigarette consumption: quasi-experimental evaluations using interrupted time series analysis and in-sample forecast event modelling

43. bmjgh 2019-001501
Analysis
Rethinking health systems in the context of urbanisation: challenges from four rapidly urbanising low-income and middle-income countries

44. Lancet. 2019 Jun 22;393(10190):2493-2502. doi: 10.1016/S0140-6736(18)32744-2. Epub 2019 May 7.
Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study.

45. Lancet. 2019 Jun 11. pii: S0140-6736(19)30934-1. doi: 10.1016/S0140-6736(19)30934-1. [Epub ahead of print]
New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis.

International Health Alerts 2019-2 Abstracts

Child Health

1. BMJ 2019;365:l1932 News

Measles: low uptake blamed on "incredulity and hostility" towards doctors

Elisabeth Mahase

Around 169 million of the world' children did not receive their first dose of measles vaccine between 2010 and 2017, an average of 21.1 million a year, shows the latest report from Unicef.

Of the world's high income countries, the US topped the list for the number of children who were not vaccinated in that time, with 2 593 000 missing out. France came second with 608 000, then the UK with 527 000.

In low and middle income countries the situation was much worse, the report said. In 2017 nearly four million children under the age of 12 months missed out on the vaccine in Nigeria—the highest number worldwide—then 2.9 million in India,

Communicable Diseases

2. Lancet 2019;393(10181):1642-56 Seminar

Tuberculosis

Furin J et al., Department of Global Health and Social Medicine, Harvard Medical School, Boston, MA, USA <jennifer_furin@hms.harvard.edu>

Tuberculosis remains the leading cause of death from an infectious disease among adults worldwide, with more than 10 million people becoming newly sick from tuberculosis each year. Advances in diagnosis, including the use of rapid molecular testing and whole-genome sequencing in both sputum and non-sputum samples, could change this situation. Although little has changed in the treatment of drug-susceptible tuberculosis, data on increased efficacy with new and repurposed drugs have led WHO to recommend all-oral therapy for drug-resistant tuberculosis for the first time ever in 2018. Studies have shown that shorter latent tuberculosis prevention regimens containing rifampicin or rifapentine are as effective as longer, isoniazid-based regimens, and there is a promising vaccine candidate to prevent the progression of infection to the disease. But new tools alone are not sufficient. Advances must be made in providing high-quality, people-centred care for tuberculosis. Renewed political will, coupled with improved access to quality care, could relegate the morbidity, mortality, and stigma long associated with tuberculosis, to the past.

Conclusions. Although tuberculosis continues to be one of the most important public health problems of the 21st century, clinical and scientific advances exist that stand to revolutionise the diagnosis, treatment, and prevention of all forms of this disease. Access to these diagnostic and therapeutic advances must be guaranteed for all as part of a human rights-based approach to tuberculosis. The political will to eliminate tuberculosis is stronger than ever; this intention must be matched with unparalleled implementation efforts to spare millions of men, women, and children from the unnecessary burden of this disease.

3. Bulletin WHO, 2019;97:405–414

Tuberculosis decline in populations affected by HIV: a retrospective study of 12 countries in the WHO African Region

Christopher Dye & Brian G Williams. Correspondence to Christopher Dye (email: chrisdye56@gmail.com).

Objective To investigate which of the World Health Organization recommended methods for tuberculosis control have had the greatest effect on case incidence in 12 countries in the World Health Organization (WHO) African Region that carry high burdens of tuberculosis linked to human immunodeficiency virus (HIV) infection.

Methods We obtained epidemiological surveillance, survey and treatment data on HIV and tuberculosis for the years 2003 to 2016. We used statistical models to examine the effects of antiretroviral therapy (ART) and isoniazid preventive therapy in reducing the incidence of tuberculosis among people living with HIV. We also investigated the role of tuberculosis case detection and treatment in preventing Mycobacterium tuberculosis transmission and consequently reducing tuberculosis incidence.

Findings Between 2003 and 2016, ART provision was associated with the decline of tuberculosis in each country, and with differences in tuberculosis decline between countries. Inferring that ART was a cause of tuberculosis decline, ART prevented 1.88 million (95% confidence interval, CI: 1.65 to 2.11) tuberculosis cases in people living with HIV, or 15.7% (95% CI: 13.8 to 17.6) of the 11.96 million HIV-positive tuberculosis cases expected. Population coverage of isoniazid preventive therapy was too low (average 1.0% of persons eligible) to have a major effect on tuberculosis decline, and improvements in tuberculosis detection and treatment were either weakly associated or not significantly associated with tuberculosis decline.

Conclusion ART provision is associated with tuberculosis decline in these 12 countries. ART should remain central to tuberculosis control where rates of tuberculosis–HIV coinfection are high, but renewed efforts to treat tuberculosis are needed.

4. Lancet 2019;393(10181):1657-68 Seminar

Tetanus

Yen LM et al., Oxford University Clinical Research Unit, Hospital for Tropical Diseases, Ho Chi Minh City, Vietnam <lthwaites@oucru.org>

Tetanus is a vaccine-preventable disease that still commonly occurs in many low-income and middle-income countries, although it is rare in high-income countries. The disease is caused by the toxin of the bacterium Clostridium tetani and is characterised by muscle spasms and autonomic nervous system dysfunction. Global vaccination initiatives have had considerable success but they continue to face many challenges. Treatment for tetanus aims to control spasms and reduce cardiovascular instability, and consists of wound debridement, antitoxin, antibiotics, and supportive care. Recent research has focused on intravenous magnesium sulphate and intrathecal antitoxin administration as methods of spasm control that can avoid the need for ventilatory support. Nevertheless, without access to mechanical ventilation, mortality from tetanus remains high. Even with such care, patients require several weeks of hospitalisation and are vulnerable to secondary problems, such as hospital-acquired infections.

Continuing challenges

Tetanus remains a challenging disease to treat, with many ongoing areas of research . For best outcomes, prolonged and costly intensive care unit treatment is needed. In many countries, a

scarcity of resources (particularly mechanical ventilation) and appropriately trained staff means that the disease continues to have high mortality. Although critical care facilities have improved in many low-income and middle-income countries, a systematic review of tetanus in Africa in 2016 found that patients were often unable to afford such care. Where care is available, little evidence is available to inform optimal and cost-effective management approaches. There have only been two clinical trials on tetanus registered with ClinicalTrials.gov since 2003; one trial is actively recruiting, whereas the other completed recruitment in 2002.

5. TMIH 2019;24(3):280-93

Treatment, prevention and public health management of impetigo, scabies, crusted scabies and fungal skin infections in endemic populations: a systematic review

May PJ et al., Northern Territory Centre for Disease Control, Casuarina, Australia

We conducted a systematic review of the treatment, prevention and public health control of skin infections including impetigo, scabies, crusted scabies and tinea in resource-limited settings where skin infections are endemic. The aim is to inform strategies, guidelines and research to improve skin health in populations that are inequitably affected by infections of the skin and the downstream consequences of these. The systematic review is reported according to the PRISMA statement. From 1759 titles identified, 81 full text studies were reviewed and key findings outlined for impetigo, scabies, crusted scabies and tinea. Improvements in primary care and public health management of skin infections will have broad and lasting impacts on overall quality of life including reductions in morbidity and mortality from sepsis, skeletal infections, kidney and heart disease.

Emergency Medicine

6. bmjgh-2019-001493 Analysis

Towards resilient health systems: opportunities to align surgical and disaster planning

Jordan Pyda et al., Program in Global Surgery and Social Change, Harvard Medical School Department of Global Health and Social Medicine, Boston, Massachusetts, USA
Correspondence toDr Jordan Pyda; jordanpyda@gmail.com

Abstract
Natural disasters significantly contribute to human death and suffering. Moreover, they exacerbate pre-existing health inequalities by imposing an additional burden on the most vulnerable populations. Robust local health systems can greatly mitigate this burden by absorbing the extraordinary patient volume and case complexity immediately after a disaster. This resilience is largely determined by the predisaster local surgical capacity, with trauma, neurosurgical, obstetrical and anaesthesia care of particular importance. Nevertheless, the disaster management and global surgery communities have not coordinated the development of surgical systems in low/middle-income countries (LMIC) with disaster resilience in mind. Herein, we argue that an appropriate peridisaster response requires coordinated surgical and disaster policy, as only local surgical systems can provide adequate disaster care in LMICs.
We highlight three opportunities to help guide this policy collaboration. First, the Lancet Commission on Global Surgery and the Sendai Framework for Disaster Risk Reduction set forth independent roadmaps for global surgical care and disaster risk reduction; however, ultimately both advocate for health system strengthening in LMICs. Second, the integration of surgical and disaster planning is necessary. Disaster risk reduction plans could recognise the role of surgical systems in disaster preparedness more explicitly and pre-emptively identify deficiencies in surgical systems. Based on these insights, National Surgical, Obstetric, and Anesthesia Plans, in turn, can better address deficiencies in systems and ensure increased disaster resilience. Lastly, the recent momentum for national surgical planning in LMICs represents a political window for the integration of surgical policy and disaster risk reduction strategies.

7. Lancet 2019;393(10187):2175 Editorial

Snakebite—emerging from the shadows of neglect

Every year, snakebites kill between 81 000 and 138 000 people and cause long-lasting disabilities in another 400 000 people. This disease burden is likely to be an underestimate given snakebite is rarely notifiable, and many bites and deaths go unrecorded. The burden of snakebite death and disability is equal to that of prostate or cervical cancer, and is greater than any other neglected tropical disease. Yet investment into snakebite has been just £30 million between 2008 and 2017, with limited research, stagnating development of treatments, and declining access to antivenoms in many countries.

Antivenom designed to treat one snake species rarely works against another, and has been developed against only about 60% of the world's venomous snakes. Less than half the antivenom needed is currently produced worldwide, and many are ineffective, unaffordable, inaccessible, or cause serious side-effects. With prompt access to the right antivenom, snakebite is rarely fatal, but in countries without strong health systems and without antivenom stockpiles, every 5 mins someone dies of snakebite and another four people will be permanently disabled. Despite antivenom being on WHO's Essential Medicines List, few African governments provide or subsidise antivenom. Most often, it is agricultural workers, women, and children living in poor, rural, and remote areas of Africa, Asia, and South America who are exposed to venomous snakes but have little or no access to health-care facilities. The breadwinners of families—coconut pickers, rice farmers, animal herders—are most at risk. Survivors are often left disfigured, destitute, and stigmatised.

In 2017, snakebite envenoming was classified by WHO as a high-priority neglected tropical disease, and in May, 2018, WHO formally resolved to combat snakebite. Last week, on May 23, at the World Health Assembly, WHO launched its roadmap, which aims to halve death and disability from snakebite by 2030. The strategy focuses on prevention of snakebite; provision of safe and effective treatment; strengthening health systems; and increased partnerships, coordination, and resources. Community education is key to prevent bites and to encourage seeking early and appropriate treatment. Accelerating development of antivenom, stockpiling antivenoms, and stabilising the market for snakebite treatments are also important.

Working closely with WHO, on May 16, Wellcome launched a new £80 million programme for snakebite, aiming to transform research to produce effective, safe, and accessible treatments for all. Over the next seven years, Wellcome commits to work with producers to make antivenoms better, safer, and cheaper; to jumpstart the development of innovative treatments tested in clinical trials; to build policy and regulatory systems that get treatments to patients; and to build and sustain snakebite as a global health priority. Wellcome will work with partners from across regions to establish an Antivenom Research Accelerator, which will include a clinical trial platform, enable testing of antivenoms and other potential treatments, and will align with an existing WHO prequalification process.

On May 17, funding for a global research consortium, the Scientific Research Partnership for Neglected Tropical Snakebite, was announced. £9 million will be given by the UK's Department for International Development over 3 years to support the consortium, which involves researchers in the UK, Nigeria, Kenya, India, and the USA. The aim is to develop novel monoclonal antibody therapies for snakebite envenoming in India and Africa, and cross-neutralising antibodies that can be used in a wide variety of snake envenomings.

Alternative approaches to monoclonal antibodies include small molecular inhibitors, such as the phospholipase inhibitor varespladib, which has shown some preclinical efficacy in neutralising venom lethality. Combating snake venom metalloproteinases might offer another route to preventing haemorrhage and coagulopathy after snakebite.

With its triad of high mortality, marked disability, and substantial psychological morbidity, snakebite warrants major investment in research. In June, 2018, shortly before his death, Kofi Annan wrote that snakebite is “the biggest public health crisis you have likely never heard of”. After decades of

relative neglect, snakebite is now firmly on the global health agenda. With a strategy and substantial funding now in place, the stage is set. Will all actors play their parts? Testing and then implementing WHO's strategy requires long-term commitment by governments of countries with a high burden of snakebite envenoming, in addition to further investment by donors. Only then will snakebite victims, who are often the poorest of the poor, have a better chance of survival.

8. Health Policy and Plan*ning*, 34, 2019 (1): 78–82

Reconceptualizing the role of emergency care in the context of global healthcare delivery

Lucas C Carlson et al. Corresponding author. Department of Emergency Medicine, Brigham & Women's Hospital, Boston. E-mail: lccarlson@mgh.harvard.edu

Since the adoption of the Sustainable Development Goals in 2015, innovation in global healthcare delivery has been recognized as a vital avenue for strengthening health systems and overcoming present implementation bottlenecks. In the recent rapid development of the science of global health-care delivery, emergency care—a critical element of the health system—has been widely overlooked. Emergency care plays a vital role in the health system through providing immediately responsive care and serving as one of the main entry points for those with symptomatic disease. We present a new perspective on emergency care's role in the health system within the context of global health-care delivery, and argue that, if properly integrated, emergency care has the potential to add significant value across the healthcare continuum. Capitalizing on emergency care as a shared delivery infrastructure presents opportunities to increase efficiency not only in treatment of time-sensitive conditions, but also for secondary prevention through its capacity to promote early disease detection and enhance coordination of care. We propose an integrated emergency care delivery value chain, demonstrating emergency care's critical position as a point of access to the greater health system and its key connections to longitudinal care delivery, which remain under-developed in low- and middle-income country health systems. As emergency care systems are created within emerging and established health systems, this role can be more effectively leveraged by policy makers and healthcare leaders globally to promote progress towards the Sustainable Development Goals.

Gender/Equity

9. Lancet 2019;393(10171):493 Editorial

Feminism is for everybody

Today, The Lancet publishes a theme issue on advancing women in science, medicine, and global health, with the aim of showcasing research, commentary, and analysis that provide new explanations and evidence for action towards gender equity. This theme issue is the result of a call for papers that led to over 300 submissions from more than 40 countries. The overwhelming conclusion from this collection of work is that, to achieve meaningful change, actions must be directed at transforming the systems that women work within—making approaches informed by feminist analyses essential.

It is well established that women are under-represented in positions of power and leadership, undervalued, and experience discrimination and gender-based violence in scientific and health disciplines across the world. Intersectional approaches have provided insights into how other categories of difference such as ethnicity, class, geography, disability, and sexuality interact with gender to compound inequalities. Most submissions to this theme issue came from high-income countries, highlighting the need to support scholarship from the Global South. Geordan Shannon and colleagues provide a global overview of gender inequality in science, medicine, and global health, and discuss the evidence for the substantial health, social, and economic gains that could be

achieved by addressing this inequality. Indeed, some studies, including one in this issue by Cassidy Sugimoto and colleagues, show that more diverse and inclusive teams lead to better science and more successful organisations.
Despite decades of recognition, these problems have proved stubbornly persistent. It is now commonplace for organisations to make public statements valuing diversity, hire diversity officers, and implement programmes to advance women's careers. Yet, all too often, such programmes locate the source of the problem, and hence the solution, within women and their own behaviour. Thus, although actions such as mentoring and skills training might be well intentioned and advantageous to a degree, they often fail to engage with broader features of systems that disproportionately privilege men. For instance, Holly Witteman and colleagues show, using data from a federal funder, how gender bias disadvantages women applying for grant funding.
Reflecting on these biases can be difficult for professions like science and medicine that are grounded in beliefs of their own objectivity and evidence-driven thinking. A trio of papers in this issue demonstrates the value of critical perspectives in this regard. Malika Sharma explains how the "historical gendering of medicine prioritises particular types of knowledge (and ways of producing that knowledge), and creates barriers for critical, and specifically feminist, research and practice". Feminist and other critical perspectives enable researchers to question the underlying assumptions that produce and maintain social hierarchies, and in doing so, imagine ways to transform fields and practices to make them more equitable and inclusive. Likewise, Sara Davies and colleagues argue that a feminist research agenda is key to advancing gender equality in global health, and Kopano Ratele and colleagues explain why efforts to engage men in advancing gender equality must be grounded in an appreciation of theories of masculinity.
For actions to have lasting and far-reaching consequences, they must therefore be directed at creating institutional-level change. Several pieces in this theme issue discuss such approaches, with a Review by Imogen Coe and colleagues providing a toolbox of organisational best practices towards gender equality in science and medicine. The Lancet's commitments to addressing gender bias in publishing are detailed in a Comment. Gender equity is not only a matter of justice and rights, it is crucial for producing the best research and providing the best care to patients. If the fields of science, medicine, and global health are to hope to work towards improving human lives, they must be representative of the societies they serve. The fight for gender equity is everyone's responsibility, and this means that feminism, too, is for everybody—for men and women, researchers, clinicians, funders, institutional leaders, and, yes, even for medical journals.

10. Lancet 2019;393(10189):2440-54

Series: Gender equality, norms, and health

Gender inequality and restrictive gender norms: framing the challenges to health

Heise, L et al., Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins School of Nursing, Baltimore, MD, USA <lheise1@jhu.edu>

This is the first in a Series of five papers about gender equality, norms, and health.
Gender is not accurately captured by the traditional male and female dichotomy of sex. Instead, it is a complex social system that structures the life experience of all human beings. This paper, the first in a Series of five papers, investigates the relationships between gender inequality, restrictive gender norms, and health and wellbeing. Building upon past work, we offer a consolidated conceptual framework that shows how individuals born biologically male or female develop into gendered beings, and how sexism and patriarchy intersect with other forms of discrimination, such as racism, classism, and homophobia, to structure pathways to poor health. We discuss the ample evidence showing the far-reaching consequences of these pathways, including how gender inequality and restrictive gender norms impact health through differential exposures, health-related behaviours and access to care, as well as how gender-biased health research and health-care systems reinforce and reproduce gender inequalities, with serious implications for health. The cumulative consequences of

structured disadvantage, mediated through discriminatory laws, policies, and institutions, as well as diet, stress, substance use, and environmental toxins, have triggered important discussions about the role of social injustice in the creation and maintenance of health inequities, especially along racial and socioeconomic lines. This Series paper raises the parallel question of whether discrimination based on gender likewise becomes embodied, with negative consequences for health. For decades, advocates have worked to eliminate gender discrimination in global health, with only modest success. A new plan and new political commitment are needed if these global health aspirations and the wider Sustainable Development Goals of the UN are to be achieved.

Also in the same issue:
series gender equality, norms, and health
Gender norms and health: insights from global survey data
Weber AM et al., Department of Pediatrics, Stanford University School of Medicine, Stanford University, Stanford, CA, USA <annweber@stanford.edu>

Health Financing/ Health Policy

11. BMJ 2019;364:l969 Research

Contribution of specific diseases and injuries to changes in health adjusted life expectancy in 187 countries from 1990 to 2013: retrospective observational study

He Chen, et al. Department of Global Health, School of Public Health, Peking University, Beijing, 100191, China ; Correspondence to: X Zheng xzheng@pku.edu.cn

Abstract
Objective: To quantify and compare the contribution of 306 diseases and injuries to the changes in health adjusted life expectancy at birth (HALE-0) between 1990 and 2013.
Design: Retrospective demographic analysis based on aggregated data and using life table technique, Sullivan method, and decomposition method for differences in health expectancy.
Setting: The globe, 21 regions, and 187 countries, covered in the Global Burden of Disease Study (GBD) 2013.
Main outcome measures: Cause specific contribution to changes in HALE0 between 1990 and 2013 in terms of mortality effect, disability effect, and total effect.
Results: Between 1990 and 2013, global HALE-0 increased by 5.31 years for males and 5.73 years for females. The cross national Gini coefficient of HALE0 for both sexes combined decreased by 15.22% from 0.0736 to 0.0624. HALE0 declined in 11 countries during the period, predominantly owing to HIV/AIDS except in Belize, Belarus, and Paraguay. Controlling communicable, maternal, neonatal, and nutritional diseases accounted for 56.47% (3.10 years) of changes in HALE0 for both sexes combined, followed by non-communicable diseases (30.05%; 1.65 years) and injuries (13.67%; 0.75 years). Globally, HIV/AIDS caused the biggest reduction in HALE0 (–0.28 years) and mainly afflicted residents in southern (–7.86 years), western (–1.53 years), and eastern (–1.38 years) sub-Saharan Africa. Diabetes had the second biggest negative total effect on changes in HALE-0 (–0.12 years), which was quite widespread across regions. Despite their positive total effect in high income regions, such non-communicable diseases as ischaemic heart disease, cerebrovascular disease, and hypertensive heart disease had a negative total effect in many low and middle income regions. Mortality reduction was the predominant driver (93.62%; 5.14 years) for improvement in HALE-0, accompanied by an increase of 0.80 years in life expectancy lived with disability at birth. Only 44 (27%) of 163 causes at level 3 in the GBD cause hierarchy influenced changes in HALE0, mainly or only through disability.
Conclusions: Between 1990 and 2013, the globe made achievements in not only promoting population health as a whole but reducing health inequality between countries. This study pinpoints the priority diseases and injuries for altering the declining health trend in 11 countries, for curbing the epidemic of non-communicable diseases in low and middle income countries, and for promoting compression of morbidity worldwide. The detailed country specific decomposition results of effects

of diseases and injuries on change in population health will further facilitate the development of national health policies.

12. BMJ 2019;364:1343 Feature Public Health

Sex workers' health: international evidence on the law's impact

Sally Howard, journalist sal@sallyhoward.net

The authors of a new systematic review say that criminalising sex workers is bad for their health and that full decriminalisation is the healthiest option. Others maintain that people buying sex should be prosecuted. Sally Howard reports

Criminalisation of sex work is linked to "extensive harms" among sex workers, concludes a systematic review of the evidence in 33 countries from 1990 to 2018. Its authors say that the review, published in PLOS Medicine,1 is the first to consider sex workers' health and safety and their access to health and social services.

The research is timely because of global political interest in new legal models of full decriminalisation and of criminalising people who pay for sex, said coauthors Lucy Platt and Pippa Grenfell of the London School of Hygiene and Tropical Medicine, launching the research in London in December. For example, Australia has seen calls for a nationwide rollout of the decriminalisation model introduced in New South Wales in 1995, and Spain's prime minister has made criminalising sex buyers a flagship policy of his first term.

Full decriminalisation

As used in New Zealand since 2003 (box), full decriminalisation should be the preferred legal model everywhere, Platt argued, as it had led to sex workers being better able to refuse clients and to insist on condom use.

13. bmjgh-2018-001184 Research

Effect of results-based financing on facility-based maternal mortality at birth: an interrupted time-series analysis with independent controls in Malawi

Manuela De Allegri et al.,
Heidelberg Institute of Global Health, University Hospital and Medical Faculty, Heidelberg University, Heidelberg, Germany
Community Health, University of Malawi College of Medicine, Blantyre 3, Malawi
Correspondence toDr Stephan Brenner; stephan.brenner@uni-heidelberg.de

Abstract

Introduction The aim of this study was to assess the impact of a results-based financing (RBF) programme on the reduction of facility-based maternal mortality at birth. Malawi is a low-income country with high maternal mortality. The Results-Based Financing For Maternal and Newborn Health (RBF4MNH) Initiative was introduced at obstetric care facilities in four districts to improve quality and utilisation of maternal and newborn health services. The RBF4MNH Initiative was launched in April 2013 as a combined supply-side and demand-side RBF. Programme expansion occurred in October 2014.

Methods Controlled interrupted time series was used to estimate the effect of the RBF4MNH on reducing facility-based maternal mortality at birth. The study sample consisted of all obstetric care facilities in 4 intervention and 19 control districts, which constituted all non-urban mainland districts in Malawi. Data for obstetric care facilities were extracted from the Malawi Health Management Information System. Facility-based maternal mortality at birth was calculated as the number of maternal deaths per all deliveries at a facility in a given time period.

Results The RBF4MNH effectively reduced facility-based maternal mortality by 4.8 (−10.3 to 0.7, $p<0.1$) maternal deaths/100 000 facility-based deliveries/month after reaching full operational capacity in October 2014. Immediate effects (changes in level rather than slope) attributable to the RBF4MNH were not statistically significant.

Conclusion This is the first study evaluating the effect of a combined supply-side and demand-side RBF on maternal mortality outcomes and demonstrates the positive role financial incentives can play

in improving health outcomes. This study further shows that timeframes spanning several years might be necessary to fully evaluate the impact of health-financing programmes on health outcomes. Further research is needed to assess the extent to which the observed reduction in facility-based mortality at birth contributes to all-cause maternal mortality in the country.

14. bmjgh-2019-001675 Commentary

Achieving affordable critical care in low-income and middle-income countries

Hugo C Turner et al.,

Summary box

Improving the quality and availability of critical care is essential for reducing the burden of preventable deaths in low-income and middle-income countries.

The conventional high-income country model, based on resource-intensive intensive care units with expensive monitoring and supportive equipment and large numbers of highly trained staff, is unlikely to be suitable for these settings.

Currently, costs severely restrict access to critical care in low-income and middle-income countries, and there is an urgent need to develop an alternative affordable critical care model for these settings.

Innovative technology and digital health may offer part of the solution and enable the development of an affordable, sustainable and scalable model of critical care in resource-limited settings.

Introduction

In 2016, an estimated 8.6 million premature deaths occurred in low-income and middle-income countries (LMICs) from causes that 'should not occur in the presence of timely and effective healthcare'. Improving the quality and availability of critical illness care in LMICs is essential if this burden is to be reduced, and even more important over the coming years as populations age and the prevalence of comorbidities, such as cardiovascular disease and diabetes, increase.

Currently, capacity for critical illness care in many LMICs is limited. In high-income countries, there are generally between 5 and 30 intensive care unit (ICU) beds per 100 000 people. The limited data available indicate that in LMICs, there are between 0.1 and 2.5 ICU beds per 100 000 people. Many countries are also transitioning from low to lower–middle income status, receiving less international healthcare aid6 which may limit resources available for expanding capacity. While, the expansion of private healthcare systems in LMICs may partly meet the increased demand, the quality of care delivered by such providers is variable and will be unaffordable for many.

15. bmjgh-2018-001376 Research

'I have no love for such people, because they leave us to suffer': a qualitative study of health workers' responses and institutional adaptations to absenteeism in rural Uganda

Raymond Tweheyo et al.,

Abstract

Background Achieving positive treatment outcomes and patient safety are critical goals of the healthcare system. However, this is greatly undermined by near universal health workforce absenteeism, especially in public health facilities of rural Uganda. We investigated the coping adaptations and related consequences of health workforce absenteeism in public and private not-for-profit (PNFP) health facilities of rural Uganda.

Methods An empirical qualitative study involving case study methodology for sampling and principles of grounded theory for data collection and analysis. Focus groups and in-depth interviews were used to interview a total of 95 healthcare workers (11 supervisors and 84 frontline workers). The NVivo V.10 QSR software package was used for data management.

Results There was tolerance of absenteeism in both the public and PNFP sectors, more so for clinicians and managers. Coping strategies varied according to the type of health facility. A majority of the PNFP participants reported emotion-focused reactions. These included unplanned work overload, stress, resulting anger directed towards coworkers and patients, shortening of consultation times and retaliatory absence. On the other hand, various cadres of public health facility participants

reported ineffective problem-solving adaptations. These included altering weekly schedules, differing patient appointments, impeding absence monitoring registers, offering unnecessary patient referrals and rampant unsupervised informal task shifting from clinicians to nurses.
Conclusion High levels of absenteeism attributed to clinicians and health service managers result in work overload and stress for frontline health workers, and unsupervised informal task shifting of clinical workload to nurses, who are the less clinically skilled. In resource-limited settings, the underlying causes of absenteeism and low staff morale require attention, because when left unattended, the coping responses to absenteeism can be seen to compromise the well-being of the workforce, the quality of healthcare and patients' access to care.

16. Lancet 2019;393(10187):2233-60

Past, present, and future of global health financing: a review of development assistance, government, out-of-pocket, and other private spending on health for 195 countries, 1995–2050
Global Burden of Disease Health Financing Collaborator Network

Background. Comprehensive and comparable estimates of health spending in each country are a key input for health policy and planning, and are necessary to support the achievement of national and international health goals. Previous studies have tracked past and projected future health spending until 2040 and shown that, with economic development, countries tend to spend more on health per capita, with a decreasing share of spending from development assistance and out-of-pocket sources. We aimed to characterise the past, present, and predicted future of global health spending, with an emphasis on equity in spending across countries.
Methods. We estimated domestic health spending for 195 countries and territories from 1995 to 2016, split into three categories—government, out-of-pocket, and prepaid private health spending—and estimated development assistance for health (DAH) from 1990 to 2018. We estimated future scenarios of health spending using an ensemble of linear mixed-effects models with time series specifications to project domestic health spending from 2017 through 2050 and DAH from 2019 through 2050. Data were extracted from a broad set of sources tracking health spending and revenue, and were standardised and converted to inflation-adjusted 2018 US dollars. Incomplete or low-quality data were modelled and uncertainty was estimated, leading to a complete data series of total, government, prepaid private, and out-of-pocket health spending, and DAH. Estimates are reported in 2018 US dollars, 2018 purchasing-power parity-adjusted dollars, and as a percentage of gross domestic product. We used demographic decomposition methods to assess a set of factors associated with changes in government health spending between 1995 and 2016 and to examine evidence to support the theory of the health financing transition. We projected two alternative future scenarios based on higher government health spending to assess the potential ability of governments to generate more resources for health.
Findings. Between 1995 and 2016, health spending grew at a rate of 4·00% (95% uncertainty interval 3·89–4·12) annually, although it grew slower in per capita terms (2·72% [2·61–2·84]) and increased by less than $1 per capita over this period in 22 of 195 countries. The highest annual growth rates in per capita health spending were observed in upper-middle-income countries (5·55% [5·18–5·95]), mainly due to growth in government health spending, and in lower-middle-income countries (3·71% [3·10–4·34]), mainly from DAH. Health spending globally reached $8·0 trillion (7·8–8·1) in 2016 (comprising 8·6% [8·4–8·7] of the global economy and $10·3 trillion [10·1–10·6] in purchasing-power parity-adjusted dollars), with a per capita spending of US$5252 (5184–5319) in high-income countries, $491 (461–524) in upper-middle-income countries, $81 (74–89) in lower-middle-income countries, and $40 (38–43) in low-income countries. In 2016, 0·4% (0·3–0·4) of health spending globally was in low-income countries, despite these countries comprising 10·0% of the global population. In 2018, the largest proportion of DAH targeted HIV/AIDS ($9·5 billion, 24·3% of total DAH), although spending on other infectious diseases (excluding tuberculosis and malaria) grew fastest from 2010 to 2018 (6·27% per year). The leading sources of DAH were the USA and private philanthropy (excluding corporate donations and the Bill & Melinda Gates Foundation). For the first

time, we included estimates of China's contribution to DAH ($644·7 million in 2018). Globally, health spending is projected to increase to $15·0 trillion (14·0–16·0) by 2050 (reaching 9·4% [7·6–11·3] of the global economy and $21·3 trillion [19·8–23·1] in purchasing-power parity-adjusted dollars), but at a lower growth rate of 1·84% (1·68–2·02) annually, and with continuing disparities in spending between countries. In 2050, we estimate that 0·6% (0·6–0·7) of health spending will occur in currently low-income countries, despite these countries comprising an estimated 15·7% of the global population by 2050. The ratio between per capita health spending in high-income and low-income countries was 130·2 (122·9–136·9) in 2016 and is projected to remain at similar levels in 2050 (125·9 [113·7–138·1]). The decomposition analysis identified governments' increased prioritisation of the health sector and economic development as the strongest factors associated with increases in government health spending globally. Future government health spending scenarios suggest that, with greater prioritisation of the health sector and increased government spending, health spending per capita could more than double, with greater impacts in countries that currently have the lowest levels of government health spending.
Interpretation. Financing for global health has increased steadily over the past two decades and is projected to continue increasing in the future, although at a slower pace of growth and with persistent disparities in per-capita health spending between countries. Out-of-pocket spending is projected to remain substantial outside of high-income countries. Many low-income countries are expected to remain dependent on development assistance, although with greater government spending, larger investments in health are feasible. In the absence of sustained new investments in health, increasing efficiency in health spending is essential to meet global health targets.

17. TMIH 2019;24(5):620-35

Clinical performance among recent graduates in nine low- and middle-income countries

Lewis TP et al., Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, MA, USA <toddlewis@g.harvard.edu>

Objectives. Recent studies have identified large and systematic deficits in clinical care in low-income countries that are likely to limit health gains. This has focused attention on effectiveness of pre-service education. One approach to assessing this is observation of clinical performance among recent graduates providing care. However, no studies have assessed performance in a standard manner across countries. We analysed clinical performance among recently graduated providers in nine low- or middle-income countries.
Methods. Service Provision Assessments from Haiti, Kenya, Malawi, Namibia, Nepal, Rwanda, Senegal, Tanzania, and Uganda were used. We constructed a Good Medical Practice Index that assesses completion of essential clinical actions using direct observations of care (range 0–1), calculated index scores by country and clinical cadre, and assessed the role of facility and clinical characteristics using regression analysis.
Results. Our sample consisted of 2223 clinicians with at least one observation of care. The Good Medical Practice score for the sample was 0.50 (SD = 0.20). Nurses and midwives had the highest score at 0.57 (SD = 0.20), followed by associate clinicians at 0.43 (SD = 0.18), and physicians at 0.42 (SD = 0.16). The average national performance varied from 0.63 (SD = 0.18) in Uganda to 0.39 (SD = 0.17) in Nepal, persisting after adjustment for facility and clinician characteristics.
Conclusions. These results show substantial gaps in clinical performance among recently graduated clinicians, raising concerns about models of clinical education. Competency-based education should be considered to improve quality of care in LMICs. Observations of care offer important insight into the quality of clinical education.

18. Health Policy and Planning, 34, 2019 (3): 161–169

Weighing the options for delivery care in rural Malawi: community perceptions of a policy promoting exclusive skilled birth attendance and banning traditional birth attendants

Isabelle Uny; Bregje de Kok; Suzanne Fustukian. Corresponding author. Faculty of health Science and Sports, Institute for Social Marketing, University of Stirling, UK. E-mail: isabelle.uny@stir.ac.uk

To address its persistently high maternal mortality, the Malawi government has prioritized strategies promoting skilled birth attendance and institutional delivery. However, in a country where 80% of the population resides in rural areas, the barriers to institutional deliveries are considerable. As a response, Malawi issued Community Guidelines in 2007 that both promoted skilled birth attendance and banned the utilization of traditional birth attendants for routine deliveries. This grounded theory study used interviews and focus groups to explore community actors' perceptions regarding the implementation of this policy and the related affects that arose from its implementation. The results revealed the complexity of decision-making and delivery care-seeking behaviours in rural areas of Malawi in the context of this policy. Although women and other actors seemed to agree that institutional deliveries were safer when complications occurred, this did not necessarily ensure their compliance. Furthermore, implementation of the 2007 Community Policy aggravated some of the barriers women already faced. This innovative bottom-up analysis of policy implementation showed that the policy had further ruptured linkages between community and health facilities, which were ultimately detrimental to the continuum of care. This study helps fill an important gap in research concerning maternal health policy implementation in Low and middle income countries (LMICs), by focusing on the perceptions of those at the receiving end of policy change. It highlights the need for globally promoted policies and strategies to take better account of local realities.

19. Health Policy and Planning, 34, 2019 (3): 216–229

A critical interpretive synthesis of informal payments in maternal health care

Marta Schaaf; Stephanie M Topp. Corresponding author. Program on Global Health Justice and Governance, Department of Population and Family Health, Mailman School of Public Health, Columbia University, New York. E-mail: mls2014@columbia.edu

Informal payments for healthcare are widely acknowledged as undercutting health care access, but empirical research is somewhat limited. This article is a critical interpretive synthesis that summarizes the evidence base on the drivers and impact of informal payments in maternal health care and critically interrogates the paradigms that are used to describe informal payments. Studies and conceptual articles identified both proximate and systems drivers of informal payments. These include norms of gift giving, health workforce scarcity, inadequate health systems financing, the extent of formal user fees, structural adjustment and the marketization of health care, and patient willingness to pay for better care. Similarly, there are proximal and distal impacts, including on household finances, patient satisfaction and provider morale. Informal payments have been studied and addressed from a variety of different perspectives, including anti-corruption, ethnographic and other in-depth qualitative approaches and econometric modelling. Summarizing and discussing the advantages and disadvantages of these and other paradigms illustrates the value of an inter-disciplinary approach. The same tacit, hidden attributes that make informal payments hard to measure also make them hard to discuss and address. A multidisciplinary health systems approach that leverages and integrates positivist, interpretivist and constructivist tools of social science research can lead to better insight. With this, we can challenge 'master narratives' and meet universalistic, equity-oriented global health objectives.

20. Health Policy and Planning, 34, 2019 (3): 230–245

Rebuilding health post-conflict: case studies, reflections and a revised framework

Spencer Rutherford Shadi Saleh Corresponding author. Global Health Institute, American University of Beirut, Beirut, Lebanon. E-mail: spencer.rutherford52@gmail.com

War and conflict negatively impact all facets of a health system; services cease to function, resources become depleted and any semblance of governance is lost. Following cessation of conflict, the

rebuilding process includes a wide array of international and local actors. During this period, stakeholders must contend with various trade-offs, including balancing sustainable outcomes with immediate health needs, introducing health reform measures while also increasing local capacity, and reconciling external assistance with indigenous legitimacy. Compounding these factors are additional challenges, including co-ordination amongst stakeholders, the re-occurrence of conflict and ulterior motives from donors and governments, to name a few. Due to these complexities, the current literature on post-conflict health system development generally examines only one facet of the health system, and only at one point in time. The health system as a whole, and its development across a longer timeline, is rarely attended to. Given these considerations, the present article aims to evaluate health system development in three post-conflict environments over a 12-year timeline. Applying and adapting a framework from Waters *et al.* (2007, *Rehabilitating Health Systems in Post-Conflict Situations*. WIDER Research Paper 2007/06. United Nations University. http://hdl.handle.net/10419/63390, accessed 1 February 2018.), health policies and inputs from the post-conflict periods of Afghanistan, Cambodia and Mozambique are assessed against health outputs and other measures. From these findings, we developed a revised framework, which is presented in this article. Overall, these findings contribute post-conflict health system development by evaluating the process holistically and along a timeline, and can be of further use by healthcare managers, policy-makers and other health professionals.

21. N Engl J Med 2019; 380:2287-2289

Perspective: Getting Coverage Right for 500 Million Indians

Sarthak Das, D.P.H., and Ashish K. Jha, M.D., M.P.H. From the Harvard Global Health Institute, Harvard T.H. Chan School of Public Health, Boston.

The motivation? India grossly underspends on health care, and health outcomes in some regions are among the worst in the world. For an emerging economic superpower, India's health care spending, accounting for less than 4% of its gross domestic product, is woefully low, and it has fallen since 2000. The majority of spending is out of pocket, burdening the middle class and the poor. Given the country's epidemiologic profile — India sees nearly a third of the world's tuberculosis cases and faces a growing burden of chronic disease — failures to invest in health have shackled the Indian economy. Government leaders, irrespective of party, now recognize that India's economic progress depends on the health of its people.

India's health reform, Ayushman Bharat ("long life for India"), has two pillars: health insurance covering up to $7,000 (500,000 Indian rupees) of care per family per year for the poorest 500 million people (regardless of preexisting conditions) and reinvestment in primary care by transforming existing facilities into 150,000 new "Health and Wellness Centers" that provide comprehensive primary care. Historically, primary care has been underfunded and disconnected from secondary and tertiary care; weak primary care has made it difficult to effectively reduce unnecessary, high hospital costs. As part of its reform, the government has created a National Health Authority to administratively link primary care and insurance expansion to foster better coordination across the continuum of care. Ayushman Bharat is seen as an important step toward achieving universal health coverage and the United Nations Sustainable Development Goal 3 ("good health and well-being"). Though these goals are laudable, there are substantial obstacles to achieving them.

//…//

India's bold step toward reform reflects an increasingly interconnected world and the desire of all people to have access to the fruits of modern medicine. From Mexico in 2006, to the United States in 2010, to China in 2016, to India now, universal coverage has become reform's rallying cry. A high-profile failure, however, will set this movement back. India has the formula to succeed, and we believe the emphases outlined here can help India show the world that health care for all is eminently possible, even in the most complex of circumstances.

HIV/AIDS

22. TMIH 2019;24(5):563-70

Changes in disclosure, adherence and healthcare interactions after the introduction of immediate ART initiation: an analysis of patient experiences in Swaziland

Molemans M, Vernooij E, Dlamini N, Shabalala FS, Khan S, van Leth F, Gomez GB, Reis R.
Department of Global Health, Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands

Introduction: There are concerns that immediate ART initiation (regardless of CD4 count) negatively affects HIV status disclosure, ART adherence and healthcare interactions. We assessed changes in these factors after the 'Early access to ART for all' intervention, a universal test-and-treat study in Swaziland.
Methods: We recruited two samples of participants between 2014 and 2017. The first group was interviewed before the intervention (control); the second group at the implementation and 6 months thereafter (intervention).
Results: High levels of disclosure to partners (controls and intervention: 94%) and family members (controls: 78%, intervention: 79%) were reported, and high levels of adherence (85% did not miss a dose among the controls, 84% in the intervention group). There were no changes in patients reporting feeling pressured to initiate ART (controls: 10%, intervention: 11%). The quality of interaction with healthcare workers improved after the intervention; healthcare workers explained more often the choice of ART initiation (controls: 88%, intervention: 93%) and the meaning of both CD4 and viral load test results (controls: 15%, intervention: 47%). More patients in the intervention group reported receiving test results (controls: 13%, intervention: 46%). We observed no changes in disclosure, adherence or patient experiences 6 months into the intervention compared to its start.
Conclusion: Our results suggest that both reported adherence and disclosure levels remain high after the introduction of immediate ART in Swaziland. We observed an improvement in the healthcare interactions, possibly due to training at participating facilities, which will be an important element for a successful roll-out of immediate ART.

23. TMIH 2019;24(6):701-14

Programmatic outcomes and impact of rapid public sector antiretroviral therapy expansion in adults prior to introduction of the WHO treat-all approach in rural Eswatini

Kerschberger B et al., Médecins Sans Frontières (Operational Centre Geneva), Mbabane, Eswatini <bernhard.kerschberger@gmail.com>

Objectives. To assess long-term antiretroviral therapy (ART) outcomes during rapid HIV programme expansion in the public sector of Eswatini (formerly Swaziland).
Methods. This is a retrospectively established cohort of HIV-positive adults (≥16 years) who started first-line ART in 25 health facilities in Shiselweni (Eswatini) between 01/2006 and 12/2014. Temporal trends in ART attrition, treatment expansion and ART coverage were described over 9 years. We used flexible parametric survival models to assess the relationship between time to ART attrition and covariates.
Results. Of 24 772 ART initiations, 6% (n = 1488) occurred in 2006, vs. 13% (n = 3192) in 2014. Between these years, median CD4 cell count at ART initiation increased (113–265 cells/mm3). The active treatment cohort expanded 8.4-fold, ART coverage increased 8.0-fold (7.1% in 2006 vs. 56.8% in 2014) and 12-month crude ART retention improved from 71% to 86%. Compared with the pre-decentralisation period (2006–2007), attrition decreased by 5% (adjusted hazard ratio [aHR] 0.95, 95% confidence interval 0.88–1.02) during HIV-TB service decentralisation (2008–2010), by 17% (aHR 0.83, 0.75–0.92) during service consolidation (2011–2012), and by 20% (aHR 0.80, 0.71–0.90) during further treatment expansion (2013–2014). The risk of attrition was higher for young age, male sex,

pathological baseline haemoglobin and biochemistry results, more toxic drug regimens, WHO III/IV staging and low CD4 cell count; access to a telephone was protective.
Conclusions. Programmatic outcomes improved during large expansion of the treatment cohort and increased ART coverage. Changes in ART programming may have contributed to better outcomes.

Malaria

24. BMJ 2019;365:l2216 Editorials

Malaria control stalls in high incidence areas

Christopher J M Whitty, Evelyn Ansah,

We have a fight on our hands to regain lost momentum

In 2015 the World Health Organization's annual World Malaria Report struck an optimistic note, reporting remarkable progress against malaria on all fronts since 2000. The number of cases had dropped at speed. Mortality from malaria in Africa, the most affected continent, had fallen by 61% overall and 71% in children under 5 years old, with 57 countries reducing their malaria burden by over 75%. The prospect of eliminating malaria from some previously endemic areas had improved. New tools, drugs, and insecticides were being developed and funding for malaria had increased. This was all the more striking because during the decades before 2000, antimalarial drug resistance had risen, as had mortality, particularly among children in Africa.

It may therefore surprise people reading the latest report, for 2018, to find a distinctly downbeat tone. WHO's director-general, Tedros Ghebreyesus, also a distinguished malariologist, warned that progress against malaria had stalled, with increases in incident malaria in the highest burden countries.

25. TMIH 2019;24(6):747-56

Outcomes of patients lost to follow-up after antiretroviral therapy initiation in rural north-eastern South Africa

Ambia J., Department of Population Health, London School of Hygiene & Tropical Medicine, London, UK <Julie.Ambia1@lshtm.ac.uk>

Objective. The vital status of patients lost to follow-up often remains unknown in antiretroviral therapy (ART) programmes in sub-Saharan Africa because medical records are no longer updated once the patient disengages from care. Thus, we aimed to assess the outcomes of patients lost to follow-up after ART initiation in north-eastern South Africa.
Methods. Using data from a rural area in north-eastern South Africa, we estimated the cumulative incidence of patient outcomes (i) after treatment initiation using clinical records, and (ii) after loss to follow-up (LTFU) using data from clients that have been individually linked to Agincourt Health and Demographic Surveillance System (AHDSS) database. Aside from LTFU, we considered mortality, re-engagement and migration out of the study site. Cox proportional hazards regression was used to identify covariates of these patient outcomes.
Results. Between April 2014 and July 2017, 3700 patients initiated ART and contributed a total of 6818 person-years of follow-up time. Three years after ART initiation, clinical record-based estimates of LTFU, mortality and documented transfers were 41.0% (95% CI: 38.5–43.4%), 1.9% (95% CI 1.0–3.2%) and 0.1% (95% CI 0.0–0.9%), respectively. Among those who were LTFU, the cumulative incidence of re-engagement, out-migration and mortality at 3 years were 38.1% (95% CI 33.1–43.0%), 49.4% (95% CI 43.1–55.3%) and 4.7% (95% CI 3.5–6.2%), respectively. Pregnant or breastfeeding women, foreigners and those who initiated ART most recently were at an increased risk of LTFU.
Conclusion. LTFU among patients starting ART in north-eastern South Africa is relatively high and has increased in recent years as more asymptomatic patients have initiated treatment. Even though this tendency is of concern in light of the prevention of onwards transmission, we also found that re-engagement in care is common and mortality among persons LTFU relatively low.

26. TMIH 2019;24(6):775-85

Growth in the first 5 years after antiretroviral therapy initiation among HIV-infected children in the IeDEA West African Pediatric Cohort

Jesson J et al., Inserm U1027, Université Paul Sabatier Toulouse 3, Toulouse, France <julie.jesson@univ-tlse3.fr>

Objective. To describe growth evolution and its correlates in the first 5 years of antiretroviral therapy (ART) initiation among HIV-infected children followed up in West Africa.
Methods. All HIV-infected children younger than 10 years followed in the IeDEA pWADA cohort while initiating ART, with at least one anthropometric measurement within the first 5 years of treatment were included in the study. Growth was described according to the WHO child growth standards, using Weight-for-age Z-score (WAZ), Height-for-age Z-score (HAZ) and Weight-for-Height/BMI-for-age Z-score (WHZ/BAZ). Growth evolution and its correlates, measured at ART initiation, were modelled in individual linear mixed models for each anthropometric indicator, with a spline term added at the 12-, 24- and 9-month time point for WAZ, HAZ and WHZ/BAZ, respectively.
Results. Among the 4156 children selected (45% girls, median age at ART initiation 3.9 years [IQR interquartile range 1.9–6.6], and overall 68% malnourished at ART initiation), important gains were observed in the first 12, 24 and 9 months on ART for WAZ, HAZ and WHZ/BAZ, respectively. Correlates at ART initiation of a better growth evolution overtime were early age (<2 years of age), severe immunodeficiency for age, and severity of malnutrition.
Conclusions. Growth evolution is particularly strong within the first 2 years on ART but slows down after this period. Weight and height gains help to recover from pre-ART growth deficiency but are insufficient for the most severely malnourished. The first year on ART could be the best period for nutritional interventions to optimize growth among HIV-infected children in the long-term.

27. Am J Trop Med Hyg. 2019 Mar;100(3):566-571. doi: 10.4269/ajtmh.18-0496.

Use of Loop-Mediated Isothermal Amplification in a Resource-Saving Strategy for Primary Malaria Screening in a Non-Endemic Setting.

Hartmeyer GN et al Department of Clinical Microbiology, Odense University Hospital, Odense, Denmark.

Malaria is traditionally diagnosed by blood smear microscopy, which requires continuous resource-demanding training. In areas with only a few cases of malaria, a simple and rapid test that can reliably exclude malaria could significantly reduce the need for microscopy and training. We evaluated whether loop-mediated isothermal amplification (LAMP) for screening malaria parasites could reduce the workload in the diagnosis of malaria. Loop-mediated isothermal amplification was used to analyze 38 ethylene-diamine-tetraacetic acid (EDTA) blood samples from 23 patients who had previously been tested for malaria by microscopy, antigen-based rapid diagnostic test (antigen-RDT), and in-house real-time polymerase chain reaction (RT-PCR). The samples included blood with low-level parasitaemia and samples with discrepancies between the results of the different methods. Loop-mediated isothermal amplification detected malaria parasites in 27 of 28 samples that were positive according to in-house RT-PCR. There were negative microscopy results in 10 of these and negative antigen-RDT results in 11. The sample with a negative LAMP result and positive in-house RT-PCR result was from a patient who had recently been treated for low-level Plasmodium falciparum malaria parasitaemia. We found LAMP to be reliable for malaria screening and suitable for replacing microscopy without loss of performance. The low number of LAMP-positive samples needing microscopy can be handled by a limited number of trained microscopists. The time saved on training and documentation was estimated to be 520 working hours yearly in our laboratory. Using LAMP for primary screening of patient samples, we have made a diagnostic workflow that ensures more reliable, faster, and less resource-demanding diagnosis of malaria.

28. Am J Trop Med Hyg. 2019 Apr;100(4):861-867. doi: 10.4269/ajtmh.18-0362.

Perspectives on Implementation Considerations and Costs of Malaria Case Management Supportive Supervision.

Eliades MJ et al Population and Family Health, Mailman School of Public Health, Columbia University, New York, New York.

Between 2012 and 2017, the U.S. President's Malaria Initiative-funded MalariaCare project supported national malaria control programs in sub-Saharan Africa to implement a case management quality assurance (QA) system for malaria and other febrile illnesses. A major component of the system was outreach training and supportive supervision (OTSS), whereby trained government health personnel visited health facilities to observe health-care practices using a standard checklist, to provide individualized feedback to staff, and to develop health facility-wide action plans based on observation and review of facility registers. Based on MalariaCare's experience, facilitating visits to more than 5,600 health facilities in nine countries, we found that programs seeking to implement similar supportive supervision schemes should consider ensuring the following: 1) develop a practical checklist that balances information gathering and mentorship; 2) establish basic competency criteria for supervisors and periodically assess supervisor performance in the field; 3) conduct both technical skills training and supervision skills training; 4) establish criteria for selecting facilities to conduct OTSS
and determine the appropriate frequency of visits; and 5) use electronic data collection systems where possible. Cost will also be a significant consideration: the average cost per OTSS visit ranged from $44 to $333. Significant variation in costs was due to factors such as travel time, allowances for government personnel, length of the visit, and involvement of central level officials. Because the cost of conducting supportive supervision prohibits regularly visiting all health facilities, internal QA measures could also be considered as alternative or complementary activities to supportive supervision.

Other titles in this series:

Performance Outcomes from Africa-Based Malaria Diagnostic Competency Assessment Courses.
Worges M et al Tulane University School of Public Health and Tropical Medicine, New Orleans, Louisiana.

Effect of Supportive Supervision on Malaria Microscopy Competencies in Sub-Saharan Africa.
Alombah F et al President's Malaria Initiative (PMI) MalariaCare Project, PATH, Washington, District of Columbia.

Effect of Supportive Supervision on Performance of Malaria Rapid Diagnostic Tests in Sub-Saharan Africa.
Eliades MJ et al Population and Family Health, Mailman School of Public Health, Columbia University, New York, New York

Effect of Supportive Supervision on Competency of Febrile Clinical Case Management in Sub-Saharan Africa.
Martin T et al President's Malaria Initiative (PMI) MalariaCare Project, PATH, Washington, District of Columbia.

Introduction and Evaluation of an Electronic Tool for Improved Data Quality and Data Use during Malaria Case Management Supportive Supervision.
Burnett SM et al President's Malaria Initiative (PMI) MalariaCare Project, PATH, Washington, District of Columbia.

29. Lancet. 2019 Jun 19. pii: S0140-6736(19)31097-9. doi: 10.1016/S0140-6736(19)31097-9. [Epub ahead of print]

Mapping the global prevalence, incidence, and mortality of Plasmodium falciparum, 2000-17: a spatial and temporal modelling study.

Weiss DJ et al Malaria Atlas Project, Big Data Institute, Li Ka Shing Centre for Health Information and Discovery, University of Oxford, Oxford, UK. peter.gething@bdi.ox.ac.uk.

BACKGROUND: Since 2000, the scale-up of malaria control interventions has substantially reduced morbidity and mortality caused by the disease globally, fuelling bold aims for disease elimination. In tandem with increased availability of geospatially resolved data, malaria control programmes increasingly use high-resolution maps to characterise spatially heterogeneous patterns of disease risk and thus efficiently target areas of high burden. METHODS: We updated and refined the Plasmodium falciparum parasite rate and clinical incidence models for sub-Saharan Africa, which rely on cross-sectional survey data for parasite rate and intervention coverage. For malaria endemic countries outside of sub-Saharan Africa, we produced estimates of parasite rate and incidence by applying an ecological downscaling approach to malaria incidence data acquired via routine surveillance. Mortality estimates were derived by linking incidence to systematically derived vital registration and verbal autopsy data. Informed by high-resolution covariate surfaces, we estimated P falciparum parasite rate, clinical incidence, and mortality at national, subnational, and 5 × 5 km pixel scales with corresponding uncertainty metrics. FINDINGS: We present the first global, high-resolution map of P falciparum malaria mortality and the first global prevalence and incidence maps since 2010. These results are combined with those for Plasmodium vivax (published separately) to form the malaria estimates for the Global Burden of Disease 2017 study. The P falciparum estimates span the period 2000-17, and illustrate the rapid decline in burden between 2005 and 2017, with incidence declining by 27·9% and mortality declining by 42·5%. Despite a growing population in endemic regions, P falciparum cases declined between 2005 and 2017, from 232·3 million (95% uncertainty interval 198·8-277·7) to 193·9 million (156·6-240·2) and deaths declined from 925 800 (596 900-1 341 100) to 618 700 (368 600-952 200). Despite the declines in burden, 90·1% of people within sub-Saharan Africa continue to reside in endemic areas, and this region accounted for 79·4% of cases and 87·6% of deaths in 2017. INTERPRETATION: High-resolution maps of P falciparum provide a contemporary
resource for informing global policy and malaria control planning, programme implementation, and monitoring initiatives. Amid progress in reducing global malaria burden, areas where incidence trends have plateaued or increased in the past 5 years underscore the fragility of hard-won gains against malaria. Efforts towards elimination should be strengthened in such areas, and those where burden remained high throughout the study period.

Also in this issue:

Mapping the global endemicity and clinical burden of Plasmodium vivax, 2000-17: a spatial and temporal modelling study.

Battle KE et al Malaria Atlas Project, Big Data Institute, Li Ka Shing Centre for Health Information and Discovery, University of Oxford, Oxford, UK. peter.gething@bdi.ox.ac.uk.

30. N Engl J Med 2019; 380:2087-2089

Perspective: A Temporizing Solution to "Artemisinin Resistance"

Jigang Wang, et al. Author Affiliations From the Artemisinin Research Center and the Institute of Chinese Materia Medica, China Academy of Chinese Medical Sciences, Beijing (J.W., C.X., F.L.L., T.J., Y.T.), and the ShenZhen People's Hospital, ShenZhen (J.W., C.X.) — both in China; the Department of Pharmacology and Biological Sciences, National University of Singapore, Singapore (J.W., C.X.); the Centre for Diagnostics and Antimicrobial Resistance, Institute for Infection and Immunity, St. George's University of London and St. George's University Hospitals NHS Foundation Trust, London (S.K.); and the Institut für Tropenmedizin, Universitätsklinikum Tübingen, Tübingen, Germany (S.K.).

Antimalarial drug resistance has arisen frequently in the past, causing familiar treatment regimens to fail, with sometimes devastating consequences. Resistance has eventually been managed when new treatments have been developed, but drug discovery is a painstaking process that takes decades of effort and considerable investment.

Despite successes of malaria-eradication campaigns launched by the World Health Organization in the 1950s, the emergence of drug-resistant parasites in many malaria-endemic areas resulted in failures of response to inexpensive drugs such as chloroquine. These failures stimulated investments in drug-discovery programs, including a national project set up by the Chinese government to consolidate its research resources. The dedication of hundreds of scientists and decades-long efforts (as part of Project 523) led to our discovery of artemisinins.

Artemisinin derivatives, used in carefully developed combinations, have since served as the first-line drugs against most uncomplicated malaria infections. Artemisinins are combined with other drugs so that the fast-acting artemisinin can immediately reduce parasitemia, allowing remaining parasites to be removed by a long-acting partner drug. Monotherapy with the artemisinin compound artesunate is used for initial management of severe disease. In geographic areas where artemisinin combinations work, there is no need to modify treatments.
A slowdown in the clearance of parasites in patients treated with artesunate sounded alarms when it was first reported from Cambodia. Subsequently, similar delays in parasite clearance were noted in countries in Asian territories, including Myanmar, Thailand, Laos, and China, collectively referred to as the Greater Mekong Subregion. It was determined that parasites that were cleared more slowly after artemisinin treatment carried mutations in the propeller domain of the malarial kelch13 (K13) gene. Although K13 mutations are not reliably associated with increased risk of treatment failure, parasites bearing these mutations are now called “artemisinin-resistant.” Phenotypically, “artemisinin resistance” is defined as a delay in parasite clearance. These parasites recrudesce more frequently than artemisinin-sensitive parasites after standard 3-day therapeutic courses with artemisinin combination treatments (ACTs).
However, 3-day courses do not contain the full treatment doses of artemisinins needed to cure infections, which last 7 to 10 days, according clinical studies conducted in China. When a 7-day treatment course of artesunate is used, it is effective even when early parasite clearance is delayed. The same is not true of resistance to other classes of antimalarials, which results in a failure to cure the infection after a full treatment course.

Should a delay in parasite clearance with artemisinin treatments be defined as drug “resistance” or “tolerance”? Either way, 3-day therapeutic courses are losing their efficacy against malarial parasites in the Greater Mekong Subregion. So what matters most to patients and populations at risk is how we handle this emerging threat.

We propose that the continued rational and strategic use of ACTs is the best, and possibly the only, solution to treatment failures for the foreseeable future. This proposition is based on two considerations related to artemisinins and their contribution to successful antimalarial therapies. The first consideration is that current artemisinin resistance continues to manifest as delayed parasite clearance with no evidence of full resistance phenotypes. Artemisinins remain effective, even if they require a longer treatment course or other modifications to the combination-treatment regimen. By contrast, when parasites have developed resistance to other antimalarials, cure rates achieved with full treatment courses have fallen. Treatment failures with artemisinin combination therapy can be directly attributed to the partner drug, despite delayed-parasite-clearance phenotypes. For example, if piperaquine–dihydroartemisinin treatment is failing in a given region, another combination, such as mefloquine plus artesunate, may prove very effective. This reciprocal relationship in sensitivities to different artemisinin-containing combinations (whereby parasites that

are, for example, resistant to piperaquine tend to be sensitive to mefloquine and vice versa) is associated with resistance mechanisms (here, pfmdr1 copy number) that influence the efficacy of the artemisinin partner drug and not of the artemisinin itself.

Medicines

31. Am J Trop Med Hyg. 2019 May;100(5):1058-1065. doi: 10.4269/ajtmh.18-0981.

Falsified and Substandard Drugs: Stopping the Pandemic.

Nayyar GML et al Rady Children's Hospital, San Diego, California.

Falsified and substandard medicines are associated with tens of thousands of deaths, mainly in young children in poor countries. Poor-quality drugs exact an annual economic toll of up to US$200 billion and contribute to the increasing peril of antimicrobial resistance. The WHO has emerged recently as the global leader in the battle against poor-quality drugs, and pharmaceutical companies have increased their roles in assuring the integrity of drug supply chains. Despite advances in drug quality surveillance and detection technology, more efforts are urgently required in research, policy, and field monitoring to halt the pandemic of bad drugs. In addition to strengthening international and national pharmaceutical governance, in part by national implementation of the Model Law on Medicines and Crime, a quantifiable Sustainable Development Goal target and an international convention to insure drug quality and safety are urgent priorities.

32. N Engl J Med 2019; 380:2389-2391

Perspective: Collateral Benefits of Preventive Chemotherapy — Expanding the War on Neglected Tropical Diseases

Peter J. Hotez, M.D., Ph.D., Alan Fenwick, Ph.D., and David H. Molyneux, D.Sc. From the National School of Tropical Medicine, Baylor College of Medicine and Texas Children’s Hospital, Houston (P.J.H.); and the Department of Infectious Disease Epidemiology, Imperial College London (A.F.), and Liverpool School of Tropical Medicine, Liverpool (D.H.M.) — both in the United Kingdom.

The collateral and extended effects of preventive chemotherapy, many of which were unanticipated, have reduced disease burdens and saved lives on a scale that appears to have exceeded the intended impact on seven neglected tropical diseases (NTDs) — the three major soil-transmitted helminth infections (ascariasis, trichuriasis, and hookworm infection), schistosomiasis, lymphatic filariasis, onchocerciasis, and trachoma.

The concept of integrated programs of mass drug administration (also referred to as preventive chemotherapy) was first proposed in the early 2000s, and such interventions now reach more than 1 billion people per year in low- and middle-income countries of Africa, Asia, and Latin America.1 Implementation of the World Health Organization (WHO) preventive chemotherapy strategy has resulted in substantial reductions in the disease burden and disability-adjusted life years (DALYs, or lost years of healthy life) — as much as a 46% decrease in DALYs — attributable to the seven NTDs, allowing some countries to achieve their elimination targets for trachoma, lymphatic filariasis, and onchocerciasis. Moreover, it has led to cost savings for the world’s poorest people, by reducing catastrophic health expenditures.

Scientists and public health experts realized at the outset of this program that the primary drugs used for preventive chemotherapy, including albendazole or mebendazole, ivermectin, praziquantel, and azithromycin, might affect conditions beyond their originally intended targets. Now, nearly 15 years after mass drug administration for NTDs was first proposed, the existence of such collateral benefits can be verified (see table).

Extended Targets of Medications Used for Preventive Chemotherapy against NTDs.		
Drug	**Original Targets**	**Extended Targets**
Albendazole or mebendazole	Ascariasis Trichuriasis Hookworm infection	Oesophagostomiasis Strongyloidiasis
Ivermectin	Lymphatic filariasis Onchocerciasis	Scabies Strongyloidiasis Loiasis Mansonelliasis Malaria transmission
Praziquantel	Schistosomiasis	Foodborne trematodiases Taeniasis
Azithromycin	Trachoma	Yaws Child mortality

Extended Targets of Medications Used for Preventive Chemotherapy against NTDs.

// ….

Since the original drug packaging for the preventive chemotherapy strategy was proposed, some exciting possibilities have been identified for drug substitutions or additions. Among these possibilities are new anthelmintic agents, such as tribendimidine (for foodborne trematodiases and soil-transmitted helminth infections); the addition of either tribendimidine or oxantel pamoate to albendazole, to increase the efficacy of treatment for trichuriasis and hookworm; and moxidectin (recently approved by the Food and Drug Administration) in place of ivermectin in some settings. A further proposed addition is nitazoxanide to target the intestinal protozoa giardia and cryptosporidium. Finally, recent studies have indicated that chemoprophylaxis with single-dose rifampin in household contacts of people with leprosy may reduce leprosy transmission and prevalence in some settings. These medications require additional clinical testing and regulatory approvals or operational research before they can be fully incorporated into the preventive chemotherapy package. New vaccines against NTDs are also under development.

One concern regarding mass drug administration, especially with azithromycin, is the potential emergence of drug resistance both to the intended target pathogens for trachoma, yaws, and leprosy and to colonizing respiratory and gastrointestinal pathogenic bacteria. So far, mass azithromycin administration has been shown not to elicit drug resistance in Chlamydia trachomatis, but it may elicit azithromycin-resistant yaws. Moving forward, it will be essential to monitor preventive chemotherapy programs for the possible emergence of drug-resistant respiratory and gastrointestinal bacterial pathogens, and anthelmintic drug resistance may also emerge. A further consideration is the integration of preventive chemotherapy for NTDs with approaches to preventing malaria and HIV/AIDS. For example, the findings regarding ivermectin's effect on malaria may inspire greater interaction between NTD- and malaria-prevention programs, and there is also renewed interest in treating female genital schistosomiasis in adolescence as a strategy for preventing HIV/AIDS.

Expanding the public health impact of preventive chemotherapy would significantly increase years of healthy life for people in affected regions and would be highly cost-effective. The mass drug administration platform is a successful manifestation of universal health coverage, and the broader range of NTD-control strategies contributes to progress toward the United Nations' Sustainable Development Goals. Such assessments are key advocacy messages that encourage further investments in NTD programs, which deploy a proven strategy that reaches more than a billion of the world's most vulnerable people each year.

Non Communicable Diseases

33. Lancet 2019;393(10185):2039-50

Effects, equity, and cost of school-based and community-wide treatment strategies for soil-transmitted helminths in Kenya: a cluster-randomised controlled trial

Pullan RL et al., Faculty of Infectious and Tropical Diseases, London School of Hygiene & Tropical Medicine, London, UK <rachel.pullan@lshtm.ac.uk>

Background. School-based deworming programmes can reduce morbidity attributable to soil-transmitted helminths in children but do not interrupt transmission in the wider community. We assessed the effects of alternative mass treatment strategies on community soil-transmitted helminth infection.
Methods. In this cluster-randomised controlled trial, 120 community units (clusters) serving 150 000 households in Kenya were randomly assigned (1:1:1) to receive albendazole through annual school-based treatment targeting 2–14 year olds or annual or biannual community-wide treatment targeting all ages. The primary outcome was community hookworm prevalence, assessed at 12 and 24 months through repeat cross-sectional surveys. Secondary outcomes were Ascaris lumbricoides and Trichuris trichiura prevalence, infection intensity of each soil-transmitted helminth species, and treatment coverage and costs. Analysis was by intention to treat. This trial is registered with ClinicalTrials.gov, number NCT02397772.
Findings. After 24 months, prevalence of hookworm changed from 18·6% (95% CI 13·9–23·2) to 13·8% (10·5–17·0) in the annual school-based treatment group, 17·9% (13·7–22·1) to 8·0% (6·0–10·1) in the annual community-wide treatment group, and 20·6% (15·8–25·5) to 6·2% (4·9–7·5) in the biannual community-wide treatment group. Relative to annual school-based treatment, the risk ratio for annual community-wide treatment was 0·59 (95% CI 0·42–0·83; p<0·001) and for biannual community-wide treatment was 0·46 (0·33–0·63; p<0·001). More modest reductions in risk were observed after 12 months. Risk ratios were similar across demographic and socioeconomic subgroups after 24 months. No adverse events related to albendazole were reported.
Interpretation. Community-wide treatment was more effective in reducing hookworm prevalence and intensity than school-based treatment, with little additional benefit of treating every 6 months, and was shown to be remarkably equitable in coverage and effects.

34. Health Policy and Planning, 34, 2019 (1): 55–66

Combating non-communicable diseases: potentials and challenges for community health workers in a digital age, a narrative review of the literature

Shiva Raj Mishra et al. Corresponding author. Nepal Development Society, Bharatpur-10, Narayani Zone, Chitwan, Nepal. E-mail: shivarajmishra@gmail.com

The use of community health workers (CHWs) has been explored as a viable option to provide home health education, counselling and basic health care, notwithstanding their challenges in training and retention. In this manuscript, we review the evidence and discuss how the digitalization affects the CHWs programmes for tackling non-communicable diseases (NCDs) in low- and middle-income countries (LMICs). We conducted a review of literature covering two databases: PubMED and Embase. A total of 97 articles were abstracted for full text review of which 26 are included in the analysis. Existing theories were used to construct a conceptual framework for understanding how digitalization affects the prospects of CHW programmes for NCDs. The results are divided into two themes: (1) the benefits of digitalization and (2) the challenges to the prospects of digitalization. We also conducted supplemental search in non-peer reviewed literature to identify and map the digital platforms currently in use in CHW programmes. We identified three benefits and three challenges of digitalization. Firstly, it will help improve the access and quality of services, notwithstanding its higher establishment and maintenance costs. Secondly, it will add efficiency in training and personnel management. Thirdly, it will leverage the use of data generated across grass-roots platforms to

further research and evaluation. The challenges posed are related to funding, health literacy of CHWs and systemic challenges related to motivating CHWs. Several dozens of digital platforms were mapped, including mobile-based networking devices (used for behavioural change communication), Web-applications (used for contact tracking, reminder system, adherence tracing, data collection and decision support), videoconference (used for decision support) and mobile applications (used for reminder system, supervision, patients' management, hearing screening and tele-consultation). The digitalization efforts of CHW programmes are afflicted by many challenges, yet the rapid technological penetration and acceptability coupled with the gradual fall in costs constitute encouraging signals for the LMICs. Both CHWs interventions and digital technologies are not inexpensive, but they may provide better value for the money when applied at the right place and time.

Sexual and Reproductive Health

35. BMJ 2019;365:l4124 News

WHO reports "concerning lack of progress" in stopping STI spread

Elisabeth Mahase

There are more than one million new cases of curable sexually transmitted infections (STIs) among people aged 15 to 49 years every day worldwide, according to the latest figures from the World Health Organization.

Approximately 1 in 25 people globally have at least one STI, with some experiencing multiple infections at the same time, and four key infections—chlamydia, gonorrhoea, trichomoniasis, and syphilis—account for over 376 million new cases annually, the report showed.

36. bmjgh 2019-001389 Research

Does voluntary medical circumcision protect against sexual transmitted infections among men and women in real-world scape-up settings? Findings of a household survey in KwaZulu-Natal, South Afica

Stephanie Davis et al.,

Abstract

Introduction: Male circumcision (MC) confers partial protection to men against HIV and, in research settings, some sexually transmitted infections (STIs). It is also associated with protection from some STIs among female partners. However, real-world data on changes in STI transmission associated with large-scale public African medical male circumcision (MMC) conducted for HIV prevention are lacking and would improve estimates of the health impact of MMC.

Methods: The HIV Incidence Provincial Surveillance System is a community-based surveillance platform for HIV prevalence, incidence and intervention coverage trends in KwaZulu-Natal province, South Africa. HIPPS collected cross-sectional self-reported data on circumcision status (from men), partner circumcision status for past three partners (from women) and demographic characteristics and behavioural risk factors; and tested participants for HIV, herpes simplex virus type 2 (HSV-2), syphilis, hepatitis

B, Neisseriagonorrhoeae, Chlamydiatrachomatis, Trichomonasvaginalis and Mycoplasmagenitalium. Bivariable and multivariable analyses were performed on associations between own (men) or partner's (women) circumcision status and each STI. Multivariable analyses adjusted for age, demographic characteristics and behavioural risk factors, and incorporated false discovery rate (FDR) correction.

Results Among men, MMC had a protective association with HSV-2 (OR 0.66, 95% CI 0.50 to 0.86), hepatitis B (OR 0.53, 95% CI 0.30 to 0.95), HIV (OR 0.50, 95% CI 0.38 to 0.65) and M.genitalium (OR 0.53, 95% CI 0.32 to 0.88). Among women, partner circumcision had a protective association with HSV-2 (OR 0.71, 95% CI 0.53 to 0.95) and HIV (OR 0.66, 95% CI 0.49 to 0.90). Associations with HIV and HSV-2 remained significant for men and all women after FDR correction.

Conclusion These real-world data, supporting protective associations between MMC conducted for HIV prevention and STIs in men and women, can help clarify the full impact of MMC and support a role in broader sexual health programming.

37. bmjgh-2019-001452 Research

The role of community health workers in cervical cancer screening in low-income and middle-income countries: a systematic scoping review of the literature

James O'Donovan, Charles O'Donovan, Shobhana Nagraj

Abstract

Introduction Community-based screening for cervical cancer and task sharing to community health workers (CHWs) have been suggested as a potential way to increase screening coverage in low- and middle-income countries (LMICs). The aims of the scoping review were to understand the following: (i) where and how CHWs are currently deployed in screening in LMIC settings; (ii) the methods used to train and support CHWs in screening, and (iii) The evidence on the cost-effectiveness of using CHWs to assist in screening.

Methods A scoping literature search of 11 major databases and the grey literature was performed between 1978 and 2018. We included comprehensive search terms for 'CHWs' and 'Cervical Cancer', and used the World Bank criteria to define LMICs.

Results Of the 420 articles screened, 15 met the inclusion criteria for review. Studies were located in Africa (n=5), Asia (n=5), and South and Central America (n=5). CHWs played a role in community education and raising awareness (n=14), conducting or assisting in cervical screening (n=5), or follow-up (n=1). 11 studies described CHW training activities. Only one study provided a formal cost analysis.

Conclusion The roles of CHWs in cervical cancer screening in LMICs have largely to date focused on education, outreach, and awareness programmes. Community-based approaches to cervical cancer screening are feasible, although the sociocultural context plays an important role in the acceptability of these interventions. Further in-depth contextually grounded studies exploring the acceptability of such interventions are required, as well as studies exploring the cost-effectiveness of involving CHWs in cervical cancer screening activities.

38. TMIH 2019;24(5):553-62

Women's recommendations: vacuum extraction or caesarean section for prolonged second stage of labour, a prospective cohort study in Uganda

Nolens B, van den Akker T, Lule J, Twinomuhangi S, van Roosmalen J, Byamugisha J.
Department of Obstetrics and Gynaecology, Mulago National Referral Hospital, Kampala, Uganda

Objectives: To investigate what women who have experienced vacuum extraction or second stage caesarean section (CS) would recommend as mode of birth in case of prolonged second stage of labour.

Methods: A prospective cohort study was conducted in a tertiary referral hospital in Uganda. Between November 2014 and July 2015, women with a term singleton in vertex presentation who had undergone vacuum extraction or second stage CS were included. The first day and 6 months after birth women were asked what they would recommend to a friend: vacuum extraction or CS and why. Outcome measures were: proportions of women choosing vacuum extraction vs. CS and reasons for choosing this mode of birth.

Results: The first day after birth, 293/318 (92.1%) women who had undergone vacuum extraction and 176/409 (43.0%) women who had undergone CS recommended vacuum extraction. Of women who had given birth by CS in a previous pregnancy and had vacuum extraction this time, 31/32 (96.9%) recommended vacuum extraction. Six months after birth findings were comparable. Less pain, shorter recovery period, avoiding surgery and the presumed relative safety of vacuum extraction to the mother were the main reasons for preferring vacuum extraction. Main reasons to opt for CS were having experienced CS without problems, CS presumed as being safer for the

neonate, CS being the only option the woman was aware of, as well as the concern that vacuum extraction would fail.
Conclusions: Most women would recommend vacuum extraction over CS in case of prolonged second stage of labour.

39. TMIH 2019;24(5):636-46

Effect of a maternal and newborn health system quality improvement project on the use of facilities for childbirth: a cluster-randomised study in rural Tanzania

Larson E et al., Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, MA, USA <elarson@mail.harvard.edu>

Objectives. Reduction in maternal and newborn mortality requires that women deliver in high quality health facilities. However, many facilities provide sub-optimal quality of care, which may be a reason for less than universal facility utilisation. We assessed the impact of a quality improvement project on facility utilisation for childbirth.
Methods. In this cluster-randomised experiment in four rural districts in Tanzania, 12 primary care clinics and their catchment areas received a quality improvement intervention consisting of in-service training, mentoring and supportive supervision, infrastructure support, and peer outreach, while 12 facilities and their catchment areas functioned as controls. We conducted a census of all deliveries within the catchment area and used difference-in-differences analysis to determine the intervention's effect on facility utilisation for childbirth. We conducted a secondary analysis of utilisation among women whose prior delivery was at home. We further investigated mechanisms for increased facility utilisation.
Results. The intervention led to an increase in facility births of 6.7 percentage points from a baseline of 72% (95% Confidence Interval: 0.6, 12.8). The intervention increased facility delivery among women with past home deliveries by 18.3 percentage points (95% CI: 10.1, 26.6). Antenatal quality increased in intervention facilities with providers performing an additional 0.5 actions across the full population and 0.8 actions for the home delivery subgroup.
Conclusions. We attribute the increased use of facilities to better antenatal quality. This increased utilisation would lead to lower maternal mortality only in the presence of improvement in care quality.

40. International Journal of Epidemiology, 2019, Vol 48 (2): 423–432

Poor diet quality in pregnancy is associated with increased risk of excess fetal growth: a prospective multi-racial/ethnic cohort study

Yeyi Zhu; et al. Corresponding author. Division of Research, Kaiser Permanente Northern California, Oakland, USA. E-mail: yeyi.zhu@kp.org.

Background
Nutritional perturbations during pregnancy may impact fetal and long-term childhood growth, although there are limited data on overall diet quality. We investigated whether diet quality, measured by the Healthy Eating Index-2010 (HEI-2010), during pregnancy was related to birthweight z-score (BWZ) and the clinically relevant birth outcomes of large- and small-for-gestational age (LGA and SGA).
Methods
In a prospective cohort of 2269 multi-racial/ethnic women from the Pregnancy Environment and Lifestyle Study (2014–2017), dietary intake was assessed by a food frequency questionnaire during early pregnancy. Offspring BWZ and LGA or SGA were derived based on gestational age-, sex-, and racial/ethnic-specific birthweight distributions. Multivariable linear and Poisson regression with robust standard errors were used.
Results

About 80% of women did not achieve good diet quality (HEI-2010 < 80). After adjusting for covariates, infants born to women in the lowest vs highest quartile of HEI-2010 (37.5–64.4 vs 78.7–94.2) had a 0.12 standard-deviation [95% confidence interval (CI) 0.01–0.23, P-for-trend = 0.023] greater BWZ and 1.76-fold (1.08–2.87, P-for-trend = 0.037) increased risk of LGA. No association was observed between HEI-2010 and SGA. Per-5-point substitution of the reversely coded empty calories component score with the whole grains component score in the HEI-2010 was related to a 25% (95% CI 0.66–0.86) lower risk of LGA.
Conclusions
Poor diet quality in pregnancy was associated with higher birthweight and increased risk of LGA independent of maternal obesity and other covariates. Substitution of empty calories with whole grains may mitigate the risk of excess fetal growth. Our findings may inform potential prevention strategies and dietary guidelines for pregnant women.

Miscellaneous

41. BMJ 2019;365:2255 Letters Patients and open access

Open access: remember doctors in developing countries

Mukunthan Murthi, physician in private practice mukunthan338@gmail.com

Just as patients' access to journals is important,1 so is the access of doctors in developing countries. Here, institutional access to scientific literature is rare, unlike in most Western countries. Subscribing to four or five ''must have'' journals, even when subsidised, costs two or three months of salary. Though subscription rates are understandable, they should not stop someone gaining desired knowledge. The excitement when a new study is published on a topic of interest soon vanishes when you know you can't afford it. Producing the next generation of medical researchers entails exposing as many medical professionals as possible to scientific research. People naturally pursue something they see as interesting. It has to be seen in order to spark interest among students and doctors in the developing world. As history shows, innovation and scientific breakthrough can come from any corner of the world: from a cancer mutation researcher working in a top university in the United Kingdom or a clinician in a rural health centre in India. Indeed, Albert Einstein and Srinivasa Ramanujam were laymen when they produced scientific breakthroughs. The biggest service journals could do for patients and medical society is to increase subsidies or make access completely free to facilitate research in the developing world. Perhaps in a few years' time, when young doctors see a great publication their next thought will be, "This is great. I'm going to learn a lot from this paper" rather than "If I buy this, will I be able to pay the rent?"

42. BMJ 2019;365:l2287 Research

Impact of the WHO Framework Convention on Tobacco Control on global cigarette consumption: quasi-experimental evaluations using interrupted time series analysis and in-sample forecast event modelling

S. J Hoffman et al., steven.hoffman@globalstrategylab.org (or @shoffmania on Twitter)
Abstract
Objective To evaluate the impact of the WHO Framework Convention on Tobacco Control (FCTC) on global cigarette consumption.
Design Two quasi-experimental impact evaluations, using interrupted time series analysis (ITS) and in-sample forecast event modelling.
Setting and population 71 countries for which verified national estimates of cigarette consumption from 1970 to 2015 were available, representing over 95% of the world's cigarette consumption and 85% of the world's population.
Main outcome measures The FCTC is an international treaty adopted in 2003 that aims to reduce harmful tobacco consumption and is legally binding on the 181 countries that have ratified it. Main outcomes were annual national estimates of cigarette consumption per adult from 71 countries since

1970, allowing global, regional, and country comparisons of consumption levels and trends before and after 2003, with counterfactual control groups modelled using pre-intervention linear time trends (for ITS) and in-sample forecasts (for event modelling).
Results No significant change was found in the rate at which global cigarette consumption had been decreasing after the FCTC's adoption in 2003, using either ITS or event modelling. Results were robust after realigning data to the year FCTC negotiations commenced (1999), or to the year when the FCTC first became legally binding in each country. By contrast to global consumption, high income and European countries showed a decrease in annual consumption by over 1000 cigarettes per adult after 2003, whereas low and middle income and Asian countries showed an increased annual consumption by over 500 cigarettes per adult when compared with a counterfactual event model.
Conclusions This study finds no evidence to indicate that global progress in reducing cigarette consumption has been accelerated by the FCTC treaty mechanism. This null finding, combined with regional differences, should caution against complacency in the global tobacco control community, motivate greater implementation of proven tobacco control policies, encourage assertive responses to tobacco industry activities, and inform the design of more effective health treaties.

43. Bmjgh 2019-001501 Analysis

Rethinking health systems in the context of urbanisation: challenges from four rapidly urbanising low-income and middle-income countries

Helen Elsey et al.,

Abstract
The world is now predominantly urban; rapid and uncontrolled urbanisation continues across low-income and middle-income countries (LMICs). Health systems are struggling to respond to the challenges that urbanisation brings. While better-off urbanites can reap the benefits from the 'urban advantage', the poorest, particularly slum dwellers and the homeless, frequently experience worse health outcomes than their rural counterparts. In this position paper, we analyse the challenges urbanisation presents to health systems by drawing on examples from four LMICs: Nigeria, Ghana, Nepal and Bangladesh. Key challenges include: responding to the rising tide of non-communicable diseases and to the wider determinants of health, strengthening urban health governance to enable multisectoral responses, provision of accessible, quality primary healthcare and prevention from a plurality of providers. We consider how these challenges necessitate a rethink of our conceptualisation of health systems. We propose an urban health systems model that focuses on: multisectoral approaches that look beyond the health sector to act on the determinants of health; accountability to, and engagement with, urban residents through participatory decision making; and responses that recognise the plurality of health service providers. Within this model, we explicitly recognise the role of data and evidence to act as glue holding together this complex system and allowing incremental progress in equitable improvement in the health of urban populations.

44. Lancet. 2019 Jun 22;393(10190):2493-2502. doi: 10.1016/S0140-6736(18)32744-2. Epub 2019 May 7.

Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study.

Manthey J et al Institute of Clinical Psychology and Psychotherapy, TU Dresden, Dresden, Germany. Electronic address: jakob.manthey@tu-dresden.de.

BACKGROUND: Alcohol use is a leading risk factor for global disease burden, and data on alcohol exposure are crucial to evaluate progress in achieving global non-communicable disease goals. We present estimates on the main indicators of alcohol exposure for 189 countries from 1990-2017, with forecasts up to 2030. METHODS: Adult alcohol per-capita consumption (the consumption in L of pure alcohol per adult [≥15 years]) in a given year was based on country-validated data up to 2016. Forecasts up to 2030 were obtained from multivariate log-normal mixture Poisson distribution models. Using survey data from 149 countries, prevalence of lifetime abstinence and current drinking

was obtained from Dirichlet regressions. The prevalence of heavy episodic drinking (30-day prevalence of at least one occasion of 60 g of pure alcohol intake among current drinkers) was estimated with fractional response regressions using survey data from 118 countries. FINDINGS: Between 1990 and 2017, global adult per-capita consumption increased from 5·9 L (95% CI 5·8-6·1) to 6·5 L (6·0-6·9), and is forecasted to reach 7·6 L (6·5-10·2) by 2030. Globally, the prevalence of lifetime abstinence decreased from 46% (42-49) in 1990 to 43% (40-46) in 2017, albeit this was not a significant reduction, while the prevalence of current drinking increased from 45% (41-48) in 1990 to 47% (44-50) in 2017. We forecast both trends to continue, with abstinence decreasing to 40% (37-44) by 2030 (annualised 0·2% decrease) and the proportion of current drinkers increasing to 50% (46-53) by 2030 (annualised 0·2% increase). In 2017, 20% (17-24) of adults were heavy episodic drinkers (compared with 1990 when it was estimated at 18·5% [15·3-21·6%], and this prevalence is expected to increase to 23% (19-27) in 2030. INTERPRETATION: Based on these data, global goals for reducing the harmful use of alcohol are unlikely to be achieved, and known effective and cost-effective policy measures should be implemented to reduce alcohol exposure. FUNDING: Centre for Addiction and Mental Health and the WHO Collaborating Center for Addiction and Mental Health at the Centre for Addiction and Mental Health.

45. Lancet. 2019 Jun 11. pii: S0140-6736(19)30934-1. doi: 10.1016/S0140-6736(19)30934-1. [Epub ahead of print]

New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis.

Charlson F et al Policy and Epidemiology Group, Queensland Centre for Mental Health Research, QLD, Australia; School of Public Health, University of Queensland, QLD, Australia; Institute for Health Metrics and Evaluation, University of Washington, Seattle, WA, USA. vanommerenm@who.int.

BACKGROUND: Existing WHO estimates of the prevalence of mental disorders in emergency settings are more than a decade old and do not reflect modern methods to gather existing data and derive estimates. We sought to update WHO estimates for the prevalence of mental disorders in conflict-affected settings and calculate the burden per 1000 population. METHODS: In this systematic review and meta-analysis, we updated a previous systematic review by searching MEDLINE (PubMed), PsycINFO, and Embase for studies published between Jan 1, 2000, and Aug 9, 2017, on the prevalence of depression, anxiety disorder, post-traumatic stress disorder, bipolar disorder, and schizophrenia. We also searched the grey literature, such as government reports, conference proceedings, and dissertations, to source additional data, and we searched datasets from existing literature reviews of the global prevalence of depression and anxiety and reference lists from the studies that were identified. We applied the Guidelines for Accurate and Transparent Health Estimates Reporting and used Bayesian meta-regression techniques that adjust for predictors of mental disorders to calculate new point prevalence estimates with 95% uncertainty intervals (UIs) in settings that had experienced conflict less than 10 years previously. FINDINGS: We estimated that the prevalence of mental disorders (depression, anxiety, post-traumatic stress disorder, bipolar disorder, and schizophrenia) was 22·1% (95% UI 18·8-25·7) at any point in time in the conflict-affected populations assessed. The mean comorbidity-adjusted, age-standardised point prevalence was 13·0% (95% UI 10·3-16·2) for mild forms of depression, anxiety, and post-traumatic stress disorder and 4·0% (95% UI 2·9-5·5) for moderate forms. The mean comorbidity-adjusted, age-standardised point prevalence for severe disorders (schizophrenia, bipolar disorder, severe depression, severe anxiety, and severe post-traumatic stress disorder) was 5·1% (95% UI 4·0-6·5). As only two studies provided epidemiological data for psychosis in conflict-affected populations, existing Global Burden of Disease Study estimates for schizophrenia and bipolar disorder were applied in these estimates for conflict-affected populations. INTERPRETATION: The burden of mental disorders is high in conflict-affected populations. Given the large numbers of people in need and the humanitarian imperative to reduce suffering, there is an urgent need to implement scalable mental health interventions to address this burden.