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Communicable Diseases

1. Lancet 2015;386(10001):1362-71

Feasibility and effectiveness of oral cholera vaccine in an urban endemic setting in Bangladesh: a cluster randomised open-label trial

Qadri F et al.

Background. Cholera is endemic in Bangladesh with epidemics occurring each year. The decision to use a cheap oral killed whole-cell cholera vaccine to control the disease depends on the feasibility and effectiveness of vaccination when delivered in a public health setting. We therefore assessed the feasibility and protective effect of delivering such a vaccine through routine government services in urban Bangladesh and evaluated the benefit of adding behavioural interventions to encourage safe drinking water and hand washing to vaccination in this setting.

Methods. We did this cluster-randomised open-label trial in Dhaka, Bangladesh. We randomly assigned 90 clusters (1:1:1) to vaccination only, vaccination and behavioural change, or no intervention. The primary outcome was overall protective effectiveness, assessed as the risk of severely dehydrating cholera during 2 years after vaccination for all individuals present at time of the second dose. This study is registered with ClinicalTrials.gov, number NCT01339845.

Findings. Of 268 896 people present at baseline, we analysed 267 270: 94 675 assigned to vaccination only, 92 539 assigned to vaccination and behavioural change, and 80 056 assigned to non-intervention. Vaccine coverage was 65% in the vaccination only group and 66% in the vaccination and behavioural change group. Overall protective effectiveness was 37% (95% CI lower bound 18%; p=0·002) in the vaccination group and 45% (95% CI lower bound 24%; p=0·001) in the vaccination and behavioural change group. We recorded no vaccine-related serious adverse events.

Interpretation. Our findings provide the first indication of the effect of delivering an oral killed whole-cell cholera vaccine to poor urban populations with endemic cholera using routine government services and will help policy makers to formulate vaccination strategies to reduce the burden of severely dehydrating cholera in such populations.

2. Lancet 2015;(386)10003:1546-55

Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013

Schweitzer A et al.

Background. The quantification of the burden of disease attributable to hepatitis B virus (HBV) infection and the adaptation of prevention and control measures requires knowledge on its prevalence in the general population. For most countries such data are not routinely available. We estimated the national, regional, and global prevalence of chronic HBV infection.

Methods. For this systematic review and pooled analysis, we searched for data on prevalence of chronic HBV infection published between Jan 1, 1965, and Oct 23, 2013, in the databases Medline, Embase, CAB Abstracts (Global health), Popline, and Web of Science. We included studies reporting the hepatitis B surface antigen (HBsAg) serological marker of chronic HBV infection in non-high-risk groups and extracted data into a customised database. For each country, we calculated HBsAg prevalence estimates and 95% CIs weighted by study size. We extrapolated prevalence estimates to population sizes in 2010 to obtain the number of individuals with chronic HBV infection.

Findings. Of the 17 029 records screened, 1800 report on the prevalence of HBsAg covering 161 countries were included. HBsAg seroprevalence was 3·61% (95% CI 3·61–3·61) worldwide with highest endemicity in countries of the African region (total 8·83%, 8·82–8·83) and Western Pacific region (total 5·26%, 5·26–5·26). Within WHO regions, prevalence ranged from 0·20% (0·19–0·21; Mexico) to 13·55% (9·00–19·89; Haiti) in the Americas, to 0·48% (0·12–1·90; the Seychelles) to 22·38% (20·10–24·83; South Sudan) in the African region. We estimated that in 2010, globally, about 248 million individuals were HBsAg positive.

Interpretation. This first global assessment of country-level population prevalence of chronic HBV infection found a wide variation between countries and highlights the need for continued prevention and control strategies and the collection of reliable epidemiologic data using standardised methodology.

3. TMIH 2015;20(10):1337-45

Cost per patient of treatment for rifampicin-resistant tuberculosis in a community-based programme in Khayelitsha, South Africa

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Objectives: The high cost of rifampicin-resistant tuberculosis (RR-TB) treatment hinders treatment access. South Africa has a high RR-TB burden, and national policy outlines decentralisation to improve access and reduce costs. We analysed health system costs associated with RR-TB treatment by drug resistance profile and treatment outcome in a decentralised programme.

Methods: Retrospective, routinely collected patient-level data were combined with unit cost data to determine costs for each patient in a cohort treated between January 2009 and December 2011. Drug costs were based on recommended regimens according to drug resistance and treatment duration. Hospitalisation costs were estimated based on admission/discharge dates, while clinic visit and diagnostic/monitoring costs were estimated according to recommendations and treatment duration. Missing data were imputed.

Results: Among 467 patients (72% HIV infected), 49% were successfully treated. Treatment was initiated in primary care for 62%, with the remainder as inpatients. The mean cost per patient treated was $7916 (range 260-87 140), ranging from $5369 among patients who did not complete treatment to $23 006 for treatment failure. Mean cost for successful treatment was

$8359 (2585-32 506). Second-line drug resistance was associated with a mean cost of $15 567 vs. $6852 for only first-line resistance, with the major cost difference due to hospitalisation. Costs are reported in 2013 USD.
Conclusions: RR-TB treatment cost was high and varied according to treatment outcome. Despite decentralisation, hospitalisation remained a significant cost, particularly among those with more extensive resistance and those with treatment failure. These cost estimates can be used to model the impact of new interventions to improve patient outcomes.

4. BMJ 2015;351:h4336, News

Thousands of Ebola survivors experience serious medical complications
Anne Gulland
The chronic conditions experienced by patients who have recovered from Ebola virus disease have been described as an "emergency within an emergency."
Daniel Bausch of the World Health Organization's clinical care team, who was speaking at a telephone press conference in Sierra Leone, said that around half of the 13 000 people who had survived the infection were reporting joint pain. Bausch described the pain as so "serious and debilitating" that it could prevent people going to work and going about their daily lives.
"These are not rare problems: these are common problems," he said. "It's an emergency within an emergency," he added.

5. BMJ 2015;351:h4661 Clinical Review

Dengue fever
Senanayake A M Kularatne, samkul@sltnet.lk
This clinical review has been developed for The BMJ in collaboration with BMJ Best Practice, based on a regularly updated web/mobile topic that supports evidence based decision making at the point of care. To view the complete and current version, please refer to the dengue fever (http://bestpractice.bmj.com/best-practice/monograph/1197.html) topic on the BMJ Best Practice website.
The bottom line

- Dengue fever is a globally important arboviral infection transmitted by the Aedes genus of mosquito (primarily A aegypti, but also A albopictus), found in tropical and subtropical regions
- The infection is endemic in more than 100 countries, particularly the South East Asia region, western Pacific region, and the Americas
- The incubation period is 3-14 days (average 7 days)
- Clinical features include fever, headache, myalgia/arthralgia, and skin flushing/rash, together with leucopenia, thrombocytopenia, and increased liver function
- Severe thrombocytopenia, haemorrhage, and plasma leakage are the key diagnostic features of the more severe forms of infection
- Confirmatory tests include detection of viral antigen or nucleic acid and serology
- Fluid therapy and the identification of the critical phase are the most important aspects of management.

6. PLoS Med 2015;12(9):e1001877

Perspective (Abridged): Moving Beyond Directly Observed Therapy for Tuberculosis.
Metcalfe JZ et al., San Francisco General Hospital, University of California; john.metcalfe@ucsf.edu
With current tb regimens, sterilization of drug-susceptible organisms requires at least six months of treatment to prevent disease relapse. Unfortunately, pill burden, drug toxicity, stigma, and poor provider practice often complicate these prolonged treatment courses, and nonadherence is widely blamed for the global epidemic of drug-resistant TB. Directly observed therapy (DOT) has for decades been considered crucial to ensuring anti-TB medication adherence worldwide, but carries important individual and health policy concerns. This week in *PLOS Medicine*, Fielding and colleagues present a cluster randomized trial of an alternative strategy—managing adherence with reminders delivered by an electronic pillbox or text messaging.
DOT is variously defined as 5–7 daily doses per week observed by facility-, workplace-, or community-based healthcare workers or confidants. Although DOT is employed selectively for other communicable and noncommunicable diseases for which incomplete adherence threatens treatment success, DOT in TB treatment has become enshrined as "canon in a field long characterized by fervor in principle and practice" as in no other disease. Conceived of as a principal standard of care to protect individuals from drug resistance amplification and communities from a potentially devastating airborne disease, DOT in some cases adversely impacts the dignity, autonomy, and livelihoods of patients who are often already poor and disenfranchised. For example, among patients receiving treatment for both HIV and drug-resistant TB, loss of a sense of agency due to provider supervision of TB treatment contributes to preferential adherence to antiretrovirals over drug-resistant TB therapy, complicating combined treatment regimens that may surpass 30 pills daily. Nevertheless, alternative strategies to DOT have received little attention.
To what degree does nonadherence lead to treatment failure or acquisition of drug resistance? In contrast to HIV, for which the complex relationship between adherence, pharmacokinetics, and resistance for each antiretroviral class is defined, the levels and patterns of adherence that lead to TB treatment failure and drug resistance remain largely unknown.
The study by Fielding and colleagues was a four-arm cluster randomized trial, involving 4,173 patients in 36 health centers across China, designed to assess the effect of dosing and refill reminders delivered by cell phone text message, electronic pillbox, or both, on patient adherence to six months of intermittent (every other day) TB treatment. The primary outcome was the proportion of patient-months in which ≥20% of doses were missed ("nonadherent months"), measured by either monthly pill counts or electronic pillbox openings (which did not produce audible reminders in the control arm of the study). Despite use of medication pillboxes, various forms of DOT, and data-informed (pill counts) counseling in the control arm, substantial

nonadherence was observed (30% nonadherent months). Electronic pillbox reminders, but not text messages alone, significantly decreased the primary outcome (17% nonadherent months). This effect was stronger when text message reminders were added to pillbox reminders (14% nonadherent months). Approximately one-tenth of patients were excluded because of inability to use mobile phones after training, and nearly one-third of randomized patients (and one-half of those in the combined text messaging and electronic pill box arm) experienced technical problems with their device. Despite substantial nonadherence to an intermittent regimen, adverse end-of-treatment outcomes, other than loss to follow up, were rare in this low HIV burden setting.

Significant technical complications in the trial related to battery connectivity suggest that additional work is needed to both confirm benefit and facilitate scale-up, and the data provide little indication of whether durable effects on treatment outcomes (beyond loss to follow-up) should be anticipated. Yet, the study by Fielding and colleagues is unusual in providing objective TB treatment adherence data combined with a scalable intervention strategy to improve adherence. If replicated, it will have important implications for global TB treatment in moving away from witnessed dosing, which is not universally feasible, towards a more personalized adherence model of patient–provider communication in which intervention is delivered where, when, and in whom it is needed to efficiently prevent adverse treatment outcome.

Will such technology aid transition to a "post-DOT" era in low- as well as high-income settings? In the field of HIV, "just-in-time" adherence interventions linked in real-time to objectively monitored adherence have overcome several limitations in traditional counseling-based interventions, which cannot anticipate decline in adherence over time or interruptions in daily adherence routines. Such approaches can potentially reduce healthcare costs by selectively targeting other medical resources (e.g., laboratory monitoring, provider visits, pharmacokinetic testing) to patients at greatest risk, while foregoing these for patients with near-perfect adherence and negligible risk of disengagement, treatment failure, or drug resistance.

In its long history with humanity, tuberculosis has in many ways provided the prototype for chronic disease management. The cornerstone of successful TB treatment has long been recognized to lie within the complex inter-relationship between patients and clinical staff and to hinge strongly on structural facilitators to the treatment experience, along with empathy. Shortened, simplified TB treatment regimens in conjunction with technologies facilitating adherence, such as real-time adherence monitoring and novel drug-delivery systems, could support this foundation to speed TB elimination while delivering truly patient-centered care.

7. PLoS Med 2015;12(10):e1001893

Water Supply Interruptions and Suspected Cholera Incidence: A Time-Series Regression in the Democratic Republic of the Congo

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Background: The eastern provinces of the Democratic Republic of the Congo have been identified as endemic areas for cholera transmission, and despite continuous control efforts, they continue to experience regular cholera outbreaks that occasionally spread to the rest of the country. In a region where access to improved water sources is particularly poor, the question of which improvements in water access should be prioritized to address cholera transmission remains unresolved. This study aimed at investigating the temporal association between water supply interruptions and Cholera Treatment Centre (CTC) admissions in a medium-sized town.

Methods and Findings: Time-series patterns of daily incidence of suspected cholera cases admitted to the Cholera Treatment Centre in Uvira in South Kivu Province between 2009 and 2014 were examined in relation to the daily variations in volume of water supplied by the town water treatment plant. Quasi-poisson regression and distributed lag nonlinear models up to 12 d were used, adjusting for daily precipitation rates, day of the week, and seasonal variations. A total of 5,745 patients over 5 y of age with acute watery diarrhoea symptoms were admitted to the CTC over the study period of 1,946 d. Following a day without tap water supply, the suspected cholera incidence rate increased on average by 155% over the next 12 d, corresponding to a rate ratio of 2.55 (95% CI: 1.54–4.24), compared to the incidence experienced after a day with optimal production (defined as the 95th percentile—4,794 m3). Suspected cholera cases attributable to a suboptimal tap water supply reached 23.2% of total admissions (95% CI 11.4%–33.2%). Although generally reporting less admissions to the CTC, neighbourhoods with a higher consumption of tap water were more affected by water supply interruptions, with a rate ratio of 3.71 (95% CI: 1.91–7.20) and an attributable fraction of cases of 31.4% (95% CI: 17.3%–42.5%). The analysis did not suggest any association between levels of residual chlorine in the water fed to the distribution network and suspected cholera incidence. Laboratory confirmation of cholera was not available for this analysis.

Conclusions: A clear association is observed between reduced availability of tap water and increased incidence of suspected cholera in the entire town of Uvira in Eastern Democratic Republic of the Congo. Even though access to piped water supplies is low in Uvira, improving the reliability of tap water supply may substantially reduce the incidence of suspected cholera, in particular in neighbourhoods having a higher access to tap water. These results argue in favour of water supply investments that focus on the delivery of a reliable and sustainable water supply, and not only on point-of-use water quality improvements, as is often seen during cholera outbreaks.

8. Am J Trop Med Hyg 2015 Sep 28. pii: 15-0332 [Epub ahead of print]

Chikungunya Virus Infections Among Dengue-Like Illness Patients at a Tertiary Care Hospital in the Philippines, 2012-2013

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Chikungunya virus (CHIKV) often co-circulates with dengue virus (DENV). A cross-sectional surveillance study was conducted at a tertiary hospital in Manila, Philippines, to describe the prevalence and characteristics of DENV and CHIKV infections among patients seeking care for dengue-like illness. Acute blood samples from patients ≥ 6 months of age clinically diagnosed with dengue from November 2012 to December 2013 underwent reverse transcriptase polymerase chain reaction (RT-PCR) to detect DENV and CHIKV RNA. A total of 118 patients with clinically diagnosed dengue (age range =

1-89 years, mean = 22 years; male-to-female ratio = 1.51) were tested by DENV RT-PCR; 40 (34%) were DENV PCR-positive (age range = 1-45 years, mean = 17 years). All DENV serotypes were detected: 11 (28%) DENV-1, six (15%) DENV-2, six (15%) DENV-3, and 17 (42%) DENV-4. Of 112 patients clinically diagnosed with dengue and tested by CHIKV RT-PCR, 11 (10%) were CHIKV PCR-positive (age range = 2-47 years, mean = 20.3 years). No coinfections were detected. Presenting signs/symptoms did not differ between DENV- and CHIKV-positive cases. Sequencing of envelope 1 gene from two CHIKV PCR-positive samples showed Asian genotype. This study highlights the potential for misdiagnosis of medically attended CHIKV infections as DENV infection and the difficulty in clinically differentiating dengue and chikungunya based on presenting signs/symptoms alone. This underscores the necessity for diagnostic laboratory tests to distinguish CHIKV infections in the background of actively co-circulating DENV.

9. Lancet 2015 Sep 13. pii: S0140-6736(15)00151-8. doi: 10.1016/S0140-6736(15)00151-8. [Epub ahead of print]

Tuberculosis

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Although the worldwide incidence of tuberculosis has been slowly decreasing, the global disease burden remains substantial (~9 million cases and ~1·5 million deaths in 2013), and tuberculosis incidence and drug resistance are rising in some parts of the world such as Africa. The modest gains achieved thus far are threatened by high prevalence of HIV, persisting global poverty, and emergence of highly drug-resistant forms of tuberculosis. Tuberculosis is also a major problem in health-care workers in both low-burden and high-burden settings. Although the ideal preventive agent, an effective vaccine, is still some time away, several new diagnostic technologies have emerged, and two new tuberculosis drugs have been licensed after almost 50 years of no tuberculosis drugs being registered. Efforts towards an effective vaccine have been thwarted by poor understanding of what constitutes protective immunity. Although new interventions and investment in control programmes will enable control, eradication will only be possible through substantial reductions in poverty and overcrowding, political will and stability, and containing co-drivers of tuberculosis, such as HIV, smoking, and diabetes.

Non-Communicable Diseases

10. Lancet 2015;386(9995):801-812

Seminar: Hypertension

Poulter NR et al.

Raised blood pressure is the biggest single contributor to the global burden of disease and to global mortality. The numbers of people affected and the prevalence of high blood pressure worldwide are expected to increase over the next decade. Preventive strategies are therefore urgently needed, especially in less developed countries, and management of hypertension must be optimised. Genetic advances in some rare causes of hypertension have been made lately, but the aggregate effect on blood pressure of all the genetic loci identified to date is small. Hence, intervention on key environmental determinants and effective implementation of trial-based therapies are needed. Three-drug combinations can control hypertension in about 90% of patients but only if resources allow identification of patients and drug delivery is affordable. Furthermore, assessment of optimal drug therapy for each ethnic group is needed.

11. Health Policy and Planning 2015; 30 (9): 1193-1206

Review: The double burden of malnutrition in SE Asia and the Pacific: priorities, policies and politics

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The double burden of malnutrition is defined by the co-existence of serious levels of under- and overnutrition. Nowhere have overweight rates risen as fast as in the regions of South East Asia and the Pacific. The regions are also burdened with high and often stagnant levels of undernutrition. For countries for which data are available, the regions contain nearly half of the individuals, world wide, suffering from a double burden of malnutrition. This article reviews the trends and their consequences and for nine countries in these two regions it reviews the drivers of the problem and attempts to manage it. The article concludes with an analysis of the political challenges and opportunities presented by the double burden and some suggestions for a leadership agenda within the region to address it.

Political leaders in SE Asia and the Pacific have a real opportunity to put the double burden high on the agenda, to undertake policy innovation and to evaluate what works and why.

Policymaking around the double burden is far from easy. But consider the alternatives. In the USA, with over 25% of the adult population suffering from diabetes, over 1 in 5 dollars of healthcare spending is related to the treatment of the disease (American Diabetes Association 2013). Low- and middle income countries cannot afford to spend this much on these diet-related chronic diseases and if they tried they would deplete health budgets for primary preventive undernutrition care. Or, put more positively, the G20—hosted by Australia in 2014—pledged to increase economic growth by 0.4% per year above current projections. This is equivalent to the economic growth generated by reducing the mortality rates for noncommunicable diseases, for which obesity and overweight are key risk factors, by 8% (Stuckler 2008).

12. Lancet 2015 Sep 19;386(9999):1110. doi: 10.1016/S0140-6736(15)00247-0

Snake bite--the neglected tropical disease

Last week, Médecins Sans Frontières drew attention to the fact that by mid-2016 sub-Saharan Africa will run out of one of the most effective treatments for snake bite, Fav-Afrique. Sanofi Pasteur stopped manufacturing the antivenom last year, and stockpiles will expire in June, 2016. Fav-Afrique is the only antivenom proven to be safe and effective to treat envenoming

by all the different types of snake in sub-Saharan Africa, where an estimated 30 000 people die from snake bite and 8000 end up with amputations every year.

Health Policy

13. Lancet 2015;386(9995):743-800

Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013

Global Burden of Disease Study 2013 Collaborators

Background. Up-to-date evidence about levels and trends in disease and injury incidence, prevalence, and years lived with disability (YLDs) is an essential input into global, regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013), we estimated these quantities for acute and chronic diseases and injuries for 188 countries between 1990 and 2013.

Methods. Estimates were calculated for disease and injury incidence, prevalence, and YLDs using GBD 2010 methods with some important refinements. Results for incidence of acute disorders and prevalence of chronic disorders are new additions to the analysis. Key improvements include expansion to the cause and sequelae list, updated systematic reviews, use of detailed injury codes, improvements to the Bayesian meta-regression method (DisMod-MR), and use of severity splits for various causes. An index of data representativeness, showing data availability, was calculated for each cause and impairment during three periods globally and at the country level for 2013. In total, 35 620 distinct sources of data were used and documented to calculated estimates for 301 diseases and injuries and 2337 sequelae. The comorbidity simulation provides estimates for the number of sequelae, concurrently, by individuals by country, year, age, and sex. Disability weights were updated with the addition of new population-based survey data from four countries.

Findings. Disease and injury were highly prevalent; only a small fraction of individuals had no sequelae. Comorbidity rose substantially with age and in absolute terms from 1990 to 2013. Incidence of acute sequelae were predominantly infectious diseases and short-term injuries, with over 2 billion cases of upper respiratory infections and diarrhoeal disease episodes in 2013, with the notable exception of tooth pain due to permanent caries with more than 200 million incident cases in 2013. Conversely, leading chronic sequelae were largely attributable to non-communicable diseases, with prevalence estimates for asymptomatic permanent caries and tension-type headache of 2·4 billion and 1·6 billion, respectively. The distribution of the number of sequelae in populations varied widely across regions, with an expected relation between age and disease prevalence. YLDs for both sexes increased from 537·6 million in 1990 to 764·8 million in 2013 due to population growth and ageing, whereas the age-standardised rate decreased little from 114·87 per 1000 people to 110·31 per 1000 people between 1990 and 2013. Leading causes of YLDs included low back pain and major depressive disorder among the top ten causes of YLDs in every country. YLD rates per person, by major cause groups, indicated the main drivers of increases were due to musculoskeletal, mental, and substance use disorders, neurological disorders, and chronic respiratory diseases; however HIV/AIDS was a notable driver of increasing YLDs in sub-Saharan Africa. Also, the proportion of disability-adjusted life years due to YLDs increased globally from 21·1% in 1990 to 31·2% in 2013.

Interpretation. Ageing of the world's population is leading to a substantial increase in the numbers of individuals with sequelae of diseases and injuries. Rates of YLDs are declining much more slowly than mortality rates. The non-fatal dimensions of disease and injury will require more and more attention from health systems. The transition to non-fatal outcomes as the dominant source of burden of disease is occurring rapidly outside of sub-Saharan Africa. Our results can guide future health initiatives through examination of epidemiological trends and a better understanding of variation across countries.

14. Lancet 2015;386(10005):1765-75

Series: Understanding the roles of faith-based health-care providers in Africa: review of the evidence with a focus on magnitude, reach, cost, and satisfaction

Olivier J et al.

At a time when many countries might not achieve the health targets of the Millennium Development Goals and the post-2015 agenda for sustainable development is being negotiated, the contribution of faith-based health-care providers is potentially crucial. For better partnership to be achieved and for health systems to be strengthened by the alignment of faith-based health-providers with national systems and priorities, improved information is needed at all levels. Comparisons of basic factors (such as magnitude, reach to poor people, cost to patients, modes of financing, and satisfaction of patients with the services received) within faith-based health-providers and national systems show some differences. As the first report in the Series on faith-based health care, we review a broad body of published work and introduce some empirical evidence on the role of faith-based health-care providers, with a focus on Christian faith-based health providers in sub-Saharan Africa (on which the most detailed documentation has been gathered). The restricted and diverse evidence reported supports the idea that faith-based health providers continue to play a part in health provision, especially in fragile health systems, and the subsequent reports in this Series review controversies in faith-based health care and recommendations for how public and faith sectors might collaborate more effectively.

15. Lancet 2015;386(10005):1776-85 (In the same Series)

Controversies in faith and health care

Tomkins PA et al.

And Lancet 2015;386(10005):1786-94

Strengthening of partnerships between the public sector and faith-based groups
Duff JF et al.

16. Trop Med Int Health. 2015;20(10):1385-95

Readiness of Ugandan health services for the management of outpatients with chronic diseases
Katende D et al., Medical Research Council/Uganda Virus Research Institute Uganda Research Unit on AIDS, Entebbe, Uganda
Objective: Traditionally, health systems in sub-Saharan Africa have focused on acute conditions. Few data exist on the readiness of African health facilities (HFs) to address the growing burden of chronic diseases (CDs), specifically chronic, non-communicable diseases (NCDs).
Methods: A stratified random sample of 28 urban and rural Ugandan HFs was surveyed to document the burden of selected CDs by analysing the service statistics, service availability and service readiness using a modified WHO Service Availability and Readiness Assessment questionnaire. Knowledge, skills and practice in the management of CDs of 222 health workers were assessed through a self-completed questionnaire.
Results: Among adult outpatient visits at hospitals, 33% were for CDs including HIV vs. 14% and 4% at medium-sized and small health centres, respectively. Many HFs lacked guidelines, diagnostic equipment and essential medicines for the primary management of CDs; training and reporting systems were weak. Lower-level facilities routinely referred patients with hypertension and diabetes. HIV services accounted for most CD visits and were stronger than NCD services. Systems were weaker in lower-level HFs. Non-doctor clinicians and nurses lacked knowledge and experience in NCD care.
Conclusion: Compared with higher level HFs, lower-level ones are less prepared and little used for CD care. Health systems in Uganda, particularly lower-level HFs, urgently need improvement in managing common NCDs to cope with the growing burden. This should include the provision of standard guidelines, essential diagnostic equipment and drugs, training of health workers, supportive supervision and improved referral systems. Substantially better HIV basic service readiness demonstrates that improved NCD care is feasible.

17. Trop Med Int Health. 2015 Nov;20(11):1569-77

Establishment of biochemistry reference values for healthy Tanzanian infants, children and adolescents in Kilimanjaro Region
Buchanan AM et al., Duke University, Durham, NC, US
Objective: To establish common biochemistry reference intervals for Tanzanian infants, children and adolescents living in the Kilimanjaro Region.
Methods: We recruited healthy, HIV-uninfected Tanzanian infants, children and youth between the ages of 1 month and 17 years from local schools and clinics to participate in this study. Only afebrile children without signs of physical or chronic illness were enrolled. Nonparametric methods were used to determine 95% reference limits and their 90% confidence intervals, with outliers removed by the Tukey method.
Results: A total of 619 healthy infants, children and adolescents were enrolled into the study. Twenty-three biochemistry parameters were measured. Compared to US reference intervals, several of the biochemistry parameters showed notable differences, namely alkaline phosphatase, phosphorus, amylase and lipase. Comparing our data to the US National Institutes of Health (NIH) Division of AIDS (DAIDS) grading criteria for classification of adverse events, we found that for selected parameters, up to 15% of infants or children in certain age groups would have been categorised as having an adverse event as defined by DAIDS.
Conclusions: Our study further confirms the need to use locally established reference intervals to define reference laboratory parameters among children in Africa, rather than relying on those derived from US or European populations. To our knowledge, this study provides the first set of locally validated biochemistry reference ranges for a paediatric population in Tanzania.

18. BMJ 2015;351:h4029 Analysis Women's, Children's, and Adolescents' Health

Effective interventions and strategies for improving early child development
Bernadette Daelmans, coordinator of policy, planning, and programme et al, on behalf of the steering committee of a new scientific series on early child development daelmansb@who.int
Investing in early child development is a smart and essential strategy for building human capital, reducing inequities, and promoting sustainable development, argue Bernadette Daelmans and colleagues
The millennium development goal on child health has led to great improvements in child survival worldwide. Child mortality has fallen by almost 50%, resulting in an estimated 17 000 fewer children dying every day in 2013 than in 1990. Nevertheless, many children who survive do not thrive, with over 200 million children under 5 years of age at risk of not attaining their developmental potential. Physical and mental health, educational and occupational attainment, family wellbeing, and the capacity for mutually rewarding social relationships all have their roots in early childhood. We now have a good understanding of the serious implications of young children going off course, including the longer term economic and societal ramifications. Here, we synthesise evidence about effective interventions and strategies to improve early child development, and call for it to be included in a new global strategy on women's, children's, and adolescents' health.

Essential interventions to support early child development:

- Preconception care

Promotion of adequate maternal nutrition; Maternal immunization; Birth spacing; Cessation of smoking and substance misuse; Detection of genetic conditions; Prevention from environmental toxins; Prevention of intimate partner violence; Support for mental health

- Maternal health

Antenatal, childbirth, and postnatal care by a skilled provider; Detection and care for maternal mental health problems

- Child health

Immunisation; Prevention and integrated management of newborn conditions; Prevention and integrated management of childhood illnesses; Counselling on Care for Child Development

- Nutrition

Counselling on infant and young child feeding, management of feeding difficulties, and inadequate growth; Counselling on Care for Child Development

- Adolescent health

Promoting health literacy and support for healthy lifestyles; Addressing adolescent health needs and agency for decision making to promote health and development

- Violence prevention

Prevention of child maltreatment; Prevention of violence in the home and community

- Environmental health

Access to safe water, sanitation, and hygiene; Access to Electricity; Safe places for play; Prevention of exposure to toxins such as lead, mercury, and pesticides; Prevention of indoor and outdoor air pollution

- Social protection

Social help and cash transfer schemes; Birth registration; Parental leave and child care; Child protection services

19. BMJ 2015;351:h4119 Analysis Women's, Children's, and Adolescents' Health

Realising the health and wellbeing of adolescents

Laura Laski, chief, sexual and reproductive health branch , on behalf of the Expert Consultative Group for Every Woman Every Child on Adolescent Health, laski@unfpa.org

Investing in adolescents' health and development is key to improving their survival and wellbeing and critical for the success of the post-2015 development agenda, argue Laura Laski and colleagues

Adolescence is a critical stage of life characterised by rapid biological, emotional, and social development. It is during this time that every person develops the capabilities required for a productive, healthy, and satisfying life. In order to make a healthy transition into adulthood, adolescents need to have access to health education, including education on sexuality; quality health services, including sexual and reproductive; and a supportive environment both at home and in communities and countries.

The global community increasingly recognises these vital needs of adolescents, and there is an emerging consensus that investing intensively in adolescents' health and development is not only key to improving their survival and wellbeing but critical for the success of the post-2015 development agenda. The suggested inclusion of adolescent health in the United Nations secretary general's Global Strategy for Women's and Children's Health is an expression of this growing awareness and represents an unprecedented opportunity to place adolescents on the political map beyond 2015. Ensuring that every adolescent has the knowledge, skills, and opportunities for a healthy, productive life and enjoyment of all human rights is essential for achieving improved health, social justice, gender equality, and other development goals.

We argue that the priority in the revised Every Women Every Child Global Strategy needs to be giving adolescents a voice, expanding their choices and control over their bodies, and enabling them to develop the capabilities required for a productive, healthy, and satisfying life. We call for a global, participatory movement to improve the health of the world's adolescents as part of a broader agenda to improve their wellbeing and uphold their rights.

20. BMJ 2015;351:h4147 Analysis Women's, Children's, and Adolescents' Health

Women's health priorities and interventions

Marleen Temmerman, director ,Rajat Khosla, Laura Laski, chief,Zoe Mathews, Lale Say, on behalf of the Women and Health Working Group for the Global Strategy for Women's, Children's and Adolescents' Health Correspondence to: R Khosla khoslar@who.int

Building on the unfinished agenda, Marleen Temmerman and colleagues elaborate actions needed to improve the health and wellbeing of women and girls around the world

Over the past decades, governments have taken steps towards improving women's health in line with commitments made in key international summits. Progress has been made in reducing maternal mortality, which accelerated with the launch of the United Nations secretary general's Global Strategy for Women's and Children's Health in 2010. Use of maternal healthcare and family planning has increased in some countries. Progress has also been seen on two determinants of women's health—school enrolment rates for girls and political participation of women—but not for others such as gender based violence. However, societies are still failing women in relation to health, especially in low resource settings. Discrimination on the basis of their sex leads to health disadvantages for women. Structural determinants of women's health, along with legal and policy restrictions, often restrict women's access to health services.

This paper elaborates the health problems women face, and priority interventions to overcome them, as a background for and informing the updating of the Global Strategy for Women's, Children's and Adolescents' Health.

21. BMJ 2015;351:h4151 Analysis Women's, Children's, and Adolescents' Health

Innovating for women's, children's, and adolescents' health

Haitham El-Noush, et al., Correspondence to: peter.singer@grandchallenges.ca

Innovation is central to reaching the sustainable development goals on women's, children's, and adolescents' health. The task now is to scale up these innovations in a sustainable way, say Haitham El-Noush and colleagues

The progress report on the UN secretary general's Global Strategy for Women's and Children's Health, Saving Lives, Protecting Futures, notes that "innovation is essential to achieving the ultimate goal of ending preventable deaths among women and children and ensuring they thrive." The report advocates for integrated innovation, which combines science and technology and social, business, and financial innovation to enable sustainability and the scaling up of interventions. Innovation is required in all aspects of the Every Woman Every Child initiative (www.everywomaneverychild.org), including health systems, social determinants of health, human rights, leadership, finance, and accountability, to help to achieve the United Nations' sustainable development goals.

Strategically, innovation forges non-traditional partnerships among the public and private sectors, attracts new sources of funding through investment opportunities for the private sector and governments, and stimulates creative ways for countries to use innovation to accelerate attainment of their health goals. Innovation complements programmes that achieve results in the near term but that may not be sustainable without ongoing support from donors.

Alongside Every Woman Every Child in 2010 the UN secretary general, Ban Ki-moon, launched an associated Innovation Working Group to advocate for, identify, and support innovations to accelerate progress on the health targets in the millennium development goals. Meanwhile, global partners of the secretary general's strategy were developing a pipeline of innovations in women's, children's, and adolescents' health. Research conducted forSaving Lives, Protecting Futures showed that more than 1000 innovations totalling over $255m (£165m; €235m) had been supported in the research and development pipeline.

We are in a watershed year. The transition from the millennium development goals to the sustainable development goals provides a pragmatic opportunity to advance the innovation agenda to ensure that the best innovations are scaled up and have maximum impact on saving and improving the lives of women and children by 2030.

In this paper we propose challenges and solutions for the post-2015 period, aimed at meeting the goals of the Global Strategy for Women's, Children's and Adolescents' Health and the sustainable development goals.

22. BMJ 2015;351:h4255 Analysis Women's, Children's, and Adolescents' Health

Ending preventable maternal and newborn mortality and stillbirths

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Doris Chou and colleagues discuss the strategic priorities needed to prevent maternal and newborn deaths and stillbirths and promote maternal and newborn health and wellbeing

Despite remarkable achievements to improve maternal and child survival, 800 women and 7700 newborns still die each day from complications during pregnancy, childbirth, and in the postnatal period; an additional 7300 women experience a stillbirth. Some countries have been able to improve health outcomes for women and children, even with relatively low health expenditures. The key to their success can be found in context specific, evidence informed strategies to improve and integrate care, supported by strong guiding principles and good governance.

This paper builds upon two strategic plans—Every Newborn: An Action Plan to End Preventable Deaths (ENAP) and the Strategies toward Ending Preventable Maternal Mortality (EPMM)—that aim to catalyse global action to eliminate wide disparities in the risk of death and end preventable maternal and newborn mortality and stillbirths within a generation. We discuss the strategic priorities and essential interventions needed to prevent maternal and newborn deaths and stillbirths and promote maternal and newborn health and wellbeing.

Global targets for ending preventable maternal and newborn mortality:

Every country should reduce its maternal mortality ratio by at least two thirds from the 2010 baseline, and no country should have a rate higher than 140 deaths per 100 000 live births (twice the global target)

Every country should have a national neonatal mortality rate of ≤12 per 1000 live births and a stillbirth rate of ≤12 per 1000 total births

The global maternal mortality ratio should be <70 maternal deaths per 100 000 live births

The global neonatal mortality rate milestone will be 9 per 1000 live births and stillbirth rate 9 per 1000 total births

23. Other titles in this series of BMJ of Analysis Women's, Children's, and Adolescents' Health are:

BMJ 2015;351:h4148

Improving the resilience and workforce of health systems for women's, children's, and adolescents' health

James Campbell, et al., campbellj@who.int

BMJ 2015;351:h4173

Nutrition and health in women, children, and adolescent girls

Francesco Branca, et al., brancaf@who.int

BMJ 2015;351:h4184

Human rights in the new Global Strategy

Jyoti Sanghera, et al on behalf of the Human Rights Subwork Stream of the Global Strategy on Women's, Children's and Adolescents' Health

BMJ 2015;351:h4213

Accountability in the 2015 Global Strategy for Women's, Children's and Adolescents' Health

Julian Schweitzer on behalf of the Expert Consultative Group for Every Women Every Child on Accountability

BMJ 2015;351:h4248
Ending preventable maternal and newborn mortality and stillbirths
Doris Chou, et al., on behalf of the Every Newborn Action Plan (ENAP) and Ending Preventable Maternal Mortality (EPMM) working groups

BMJ 2015;351:h4267
Financing women's, children's, and adolescents' health
Geir Sølve Sande Lie, Agnes L B Soucat, and Suprotik Basu

BMJ 2015;351:h4282
National leadership: driving forward the updated Global Strategy for Women's, Children's and Adolescents' Health
C K Mishra, et al.

BMJ 2015;351:h4300
Children's health priorities and interventions
Wilson M Were, et al.

BMJ 2015;351:h4327
Prioritising women's, children's, and adolescents' health in the post-2015 world
Lori McDougall, et al.

BMJ 2015;351:h4346
Women's, children's, and adolescents' health in humanitarian and other crises
Sarah Zeid, et al.

BMJ 2015;351:h4414 Analysis Women's, Children's, and Adolescents' Health
Towards a new Global Strategy for Women's, Children's and Adolescents' Health
Marleen Temmerman, et al, Correspondence to: R Khosla khoslar@who.int

24. Health Policy and Planning 2015;30(8):1053-1058

Ten best resources for conducting financing and benefit incidence analysis in resource-poor settings.
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Many low- and middle-income countries are seeking to reform their health financing systems to move towards universal coverage. This typically means that financing is based on people's ability to pay while, for service use, benefits are based on the need for health care. Financing incidence analysis (FIA) and benefit incidence analysis (BIA) are two popular tools used to assess equity in health systems financing and service use. FIA studies examine who pays for the health sector and how these contributions are distributed according to socioeconomic status (SES). BIA determines who benefits from health care spending, with recipients ranked by their relative SES. In this article, we identify 10 resources to assist researchers and policy makers seeking to undertake or interpret findings from financing and benefit incidence analyses in the health sector. The article pays particular attention to the data requirements, computations, methodological challenges and country level experiences with these types of analyses.

1 O'Donnell O, Doorslaer E, Wagstaff A et al. 2008. Analysing Health Equity Using Household Survey Data. World Bank: World Bank Institute (Explanation of techniques—including computation Methodological challenges)
2 McIntyre D, Ataguba J. 2011. How to do (or not to do) ... a benefit incidence analysis. Health Policy and Planning 26: 174–82 (Explanation of techniques—including computation Methodological challenges)
3 Mills A, Ataguba JE, Akazil J et al. 2012. Equity in financing and use of health care in Ghana, South Africa, and Tanzania: implications for paths to universal coverage. Lancet 14: 126–33 (Practical application: comparative study from Africa)
4 O'Donnell O, van Doorslaer E, Rannan-Eliya RP et al. 2007. The incidence of public spending on healthcare: comparative evidence from Asia. World Bank Economic Review 21: 93–123 (Practical application: comparative study from Asia)
5 Borghi J, Ataguba J, Mtei G et al. 2009. Methodological challenges in evaluating health care financing equity in data-poor contexts: lessons from Ghana, South Africa and Tanzania. Advances in Health Economics and Health Services Research 21: 133–56 (Methodological challenges)
6 Vyas S, Kumaranayake L. 2006. Constructing socio-economic status indices: how to use principal components analysis. Health Policy and Planning 21: 459–68 (Explanation of techniques Methodological challenges)
7 Limwattananon S, Tangcharoensathien V, Tisayaticom K et al. 2012. Why has the Universal Coverage Scheme in Thailand achieved a pro-poor public subsidy for health care? BMC Public Health 12: S6 (Exploring factors influencing financing and benefit incidence)
8 Macha J, Harris B, Garshong B et al. 2012. Factors influencing the burden of health care financing and the distribution of health care benefits in Ghana, Tanzania and South Africa. Health Policy and Planning 27: i46–i54 (Exploring factors influencing financing and benefit incidence)
9 Wagstaff A. 2012. Benefit Incidence Analysis: are government health expenditures more pro-rich than we think? Health Economics 21: 351–66 (Methodological challenges)
10 Munge K, Briggs A. 2013. The Progressivity of health care financing in Kenya. Health Policy and Planning 1–9 (Methodological challenges).

25. Health Policy and Planning 2015;3(8)1044-1052

Evidence on access to medicines for chronic diseases from household surveys in five low- and middle-income countries

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The 2011 United Nations (UN) General Assembly Political Declaration on Prevention and Control of Non-Communicable Diseases (NCDs) brought NCDs to the global health agenda. Essential medicines are central to treating chronic diseases such as hypertension and diabetes. Our study aimed to quantify access to essential medicines for people with chronic conditions in five low- and middle-income countries and to evaluate how household socioeconomic status and perceptions about medicines availability and affordability influence access.

We analysed data for 1867 individuals with chronic diseases from national surveys (Ghana, Jordan, Kenya, Philippines and Uganda) conducted in 2007–10 using a standard World Health Organization (WHO) methodology to measure medicines access and use. We defined individuals as having access to medicines if they reported regularly taking medicine for a diagnosed chronic disease and data collectors found a medicine indicated for that disease in their homes. We used logistic regression models accounting for the clustered survey design to investigate determinants of keeping medicines at home and predictors of access to medicines for chronic diseases.

Less than half of individuals previously diagnosed with a chronic disease had access to medicines for their condition in every country, from 16% in Uganda to 49% in Jordan. Other than reporting a chronic disease, higher household socioeconomic level was the most significant predictor of having any medicines available at home. The likelihood of having access to medicines for chronic diseases was higher for those with medicines insurance coverage [highest adjusted odds ratio (OR) 3.12 (95% confidence intervals (CI): 1.38, 7.07)] and lower for those with past history of borrowing money to pay for medicines [lowest adjusted OR 0.56 (95% CI: 0.34, 0.92)].

Our study documents poor access to essential medicines for chronic conditions in five resource-constrained settings. It highlights the importance of financial risk protection and consumer education about generic medicines in global efforts towards improving treatment of chronic diseases.

26. Health Policy and Planning 2015;3 (9) 1207-1227

Which intervention design factors influence performance of community health workers in low- and middle-income countries? A systematic review.

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Community health workers (CHWs) are increasingly recognized as an integral component of the health workforce needed to achieve public health goals in low and middle-income countries (LMICs). Many factors influence CHW performance. A systematic review was conducted to identify intervention design related factors influencing performance of CHWs. We systematically searched six databases for quantitative and qualitative studies that included CHWs working in promotional, preventive or curative primary health services in LMICs. One hundred and forty studies met the inclusion criteria, were quality assessed and double read to extract data relevant to the design of CHW programmes. A preliminary framework containing factors influencing CHW performance and characteristics of CHW performance (such as motivation and competencies) guided the literature search and review. A mix of financial and non-financial incentives, predictable for the CHWs, was found to be an effective strategy to enhance performance, especially of those CHWs with multiple tasks. Performance-based financial incentives sometimes resulted in neglect of unpaid tasks. Intervention designs which involved frequent supervision and continuous training led to better CHW performance in certain settings. Supervision and training were often mentioned as facilitating factors, but few studies tested which approach worked best or how these were best implemented. Embedment of CHWs in community and health systems was found to diminish workload and increase CHW credibility. Clearly defined CHW roles and introduction of clear processes for communication among different levels of the health system could strengthen CHW performance. When designing community-based health programmes, factors that increased CHW performance in comparable settings should be taken into account. Additional intervention research to develop a better evidence base for the most effective training and supervision mechanisms and qualitative research to inform policymakers in development of CHW interventions are needed.

27. Health Policy 2015;119:11451152

Universal health insurance coverage for 1.3 billion people: What accounts for China's success?

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China successfully achieved universal health insurance coverage in 2011, representing the largest expansion of insurance coverage in human history. While the achievement is widely recognized, it is still largely unexplored why China was able to attain it within a short period. This study aims to fill the gap. Through a systematic political and socio-economic analysis, it identifies seven major drivers for China's success, including (1) the SARS outbreak as a wake-up call, (2) strong public support for government intervention in health care, (3) renewed political commitment from top leaders, (4) heavy government subsidies, (5) fiscal capacity backed by China's economic power, (6) financial and political responsibilities delegated to local governments and (7) programmatic implementation strategy. Three of the factors seem to be unique to China (i.e., the SARS outbreak, the delegation, and the programmatic strategy.) while the other factors are commonly found in other countries' insurance expansion experiences. This study also discusses challenges and recommendations for China's health financing, such as reducing financial risk as an immediate task, equalizing benefit across insurance programs as a long-term goal, improving quality by tying provider payment to performance, and controlling costs through coordinated reform initiatives. Finally, it draws lessons for other developing countries.

28. Social Science & Medicine 2015;142:90-99

Informal m-health: How are young people using mobile phones to bridge healthcare gaps in Sub-Saharan Africa?
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The African communications 'revolution' has generated optimism that mobile phones might help overcome infrastructural barriers to healthcare provision in resource-poor contexts. However, while formal m-health programmes remain limited in coverage and scope, young people are using mobile phones creatively and strategically in an attempt to secure effective healthcare. Drawing on qualitative and quantitative data collected in 2012e2014 from over 4500 young people (aged 8-25 y) in Ghana, Malawi and South Africa, this paper documents these practices and the new therapeutic opportunities they create, alongside the constraints, contingencies and risks. We argue that young people are endeavouring to lay claim to a digitally-mediated form of therapeutic citizenship, but that a lack of appropriate resources, social networks and skills ('digital capital'), combined with ongoing shortcomings in healthcare delivery, can compromise their ability to do this effectively. The paper concludes by offering tentative suggestions for remedying this situation.
What might this mean in practice? First, appropriate, up-to-date education (in-school and out-of-school) could play an important role. Currently, schools in Ghana, Malawi and South Africa only cover phone/e-safety and internet skills in a cursory, piecemeal fashion (Porter et al., 2015). Making these a core part of national curricula could help young people to use IT resources more effectively, without being duped or unnecessarily alarmed by misleading/biased information. This should go hand-in-hand with the development of web-based resources that give accurate, reliable, realistic and up-to-date health information/advice. Tighter regulation of medical advertisements, especially those targeting young people, is another issue that deserves careful consideration. None of this should, of course, distract from the urgent need to accelerate investment in Universal Health Coverage and particularly youth-friendly services, without which m-health (formal or informal) lacks foundation.

29. Am J Trop Med Hyg 2015 Sep 28. pii: 15-0421 [Epub ahead of print]
Point-of-Care Ultrasound Assessment of Tropical Infectious Diseases-A Review of Applications and Perspectives.
Bélard S et al., Division of Internal Medicine, Department of Infectious Diseases, Center of Tropical Medicine and Travel Medicine, Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands
The development of good quality and affordable ultrasound machines has led to the establishment and implementation of numerous point-of-care ultrasound (POCUS) protocols in various medical disciplines. POCUS for major infectious diseases endemic in tropical regions has received less attention, despite its likely even more pronounced benefit for populations with limited access to imaging infrastructure. Focused assessment with sonography for HIV-associated TB (FASH) and echinococcosis (FASE) are the only two POCUS protocols for tropical infectious diseases, which have been formally investigated and which have been implemented in routine patient care today. This review collates the available evidence for FASH and FASE, and discusses sonographic experiences reported for urinary and intestinal schistosomiasis, lymphatic filariasis, viral hemorrhagic fevers, amebic liver abscess, and visceral leishmaniasis. Potential POCUS protocols are suggested and technical as well as training aspects in the context of resource-limited settings are reviewed. Using the focused approach for tropical infectious diseases will make ultrasound diagnosis available to patients who would otherwise have very limited or no access to medical imaging.

30. Lancet 2015 Oct 20. pii: S0140-6736(15)00469-9. doi: 10.1016/S0140-6736(15)00469-9 [Epub ahead of print]
Availability and affordability of cardiovascular disease medicines and their effect on use in high-income, middle-income, and low-income countries: an analysis of the PURE study data.
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Background: WHO has targeted that medicines to prevent recurrent cardiovascular disease be available in 80% of communities and used by 50% of eligible individuals by 2025. We have previously reported that use of these medicines is very low, but now aim to assess how such low use relates to their lack of availability or poor affordability.
Methods: We analysed information about availability and costs of cardiovascular disease medicines (aspirin, β blockers, angiotensin-converting enzyme inhibitors, and statins) in pharmacies gathered from 596 communities in 18 countries participating in the Prospective Urban Rural Epidemiology (PURE) study. Medicines were considered available if present at the pharmacy when surveyed, and affordable if their combined cost was less than 20% of household capacity-to-pay. We compared results from high-income, upper middle-income, lower middle-income, and low-income countries. Data from India were presented separately given its large, generic pharmaceutical industry.
Findings: Communities were recruited between Jan 1, 2003, and Dec 31, 2013. All four cardiovascular disease medicines were available in 61 (95%) of 64 urban and 27 (90%) of 30 rural communities in high-income countries, 53 (80%) of 66 urban and 43 (73%) of 59 rural communities in upper middle-income countries, 69 (62%) of 111 urban and 42 (37%) of 114 rural communities in lower middle-income countries, eight (25%) of 32 urban and one (3%) of 30 rural communities in low-income countries (excluding India), and 34 (89%) of 38 urban and 42 (81%) of 52 rural communities in India. The four cardiovascular disease medicines were potentially unaffordable for 0·14% of households in high-income countries (14 of 9934 households), 25% of upper middle-income countries (6299 of 24 776), 33% of lower middle-income countries (13 253 of 40 023), 60% of low-income countries (excluding India; 1976 of 3312), and 59% households in India (9939 of 16 874). In low-income and middle-income countries, patients with previous cardiovascular disease were less likely to use all four medicines if fewer than four were available (odds ratio [OR] 0·16, 95% CI 0·04-0·57). In communities in which all four medicines were available, patients were less likely to use medicines if the household potentially could not afford them (0·16, 0·04-0·55).
Interpretation: Secondary prevention medicines are unavailable and unaffordable for a large proportion of communities and households in upper middle-income, lower middle-income, and low-income countries, which have very low use of these medicines. Improvements to the availability and affordability of key medicines is likely to enhance their use and help towards achieving WHO's targets of 50% use of key medicines by 2025.

HIV

31. Lancet 2015;386(9989):171-218

Defeating AIDS—advancing global health

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Key recommendations

• Get serious about HIV prevention—including combination prevention—and continue the expansion of access to treatment, while also working to address structural determinants of health that put people at risk

• Forge new paths to uphold human rights and address criminalisation, stigma, and discrimination using practical approaches to change laws, policies, and public attitudes that violate human rights

• Urgently ramp up and fully fund AIDS efforts efficiently, and emphasise sustainability; the next 5 years present a window of opportunity to scale up the AIDS response to end AIDS as a public health problem by 2030; failing to do so, and to continue the already significant efforts, will increase the number of deaths and new HIV infections by 2020

• Demand robust accountability, transparency, and better data; this relies on fresh processes and mechanisms to enable more transparent data review, improve research on high-risk populations, and link data to policies and programmes

• Reinforce and renew the leadership and engagement of people living with HIV, strengthening and expanding their decision-making roles in policy design, implementation, and evaluation, and invest in activism as a global public good

• Invest in research and innovation in all facets of the AIDS response; an effective vaccine and a cure remain priorities, and others include epidemiological studies of high-risk populations and hot spots, socio-behavioural research, implementation research, and country-specific research on how services are delivered across health care

• Promote more inclusive, coherent, and accountable AIDS and health governance; establish a multi-stakeholder, multi-sector platform to address determinants of health

32. Health Policy and Planning 2015;30(8):964-975

Rewards and challenges of providing HIV testing and counselling services: health worker perspectives from Burkina Faso, Kenya and Uganda

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The rapid scale-up of human immunodeficiency virus (HIV) testing, counselling and treatment throughout sub-Saharan Africa has raised questions about how to protect patients' rights to consent, confidentiality, counselling and care in resource-constrained settings. The Multi-country African Testing and Counselling for HIV (MATCH) study investigated client and provider experiences with different modes of testing in sub-Saharan Africa. One component of that study was a survey of 275 HIV service providers in Burkina Faso, Kenya and Uganda that gathered quantifiable indicators and qualitative descriptions using a standardized instrument. This article presents provider perspectives on the challenges of obtaining consent, protecting confidentiality, providing counselling and helping clients manage disclosure. It also explores health workers' fear of infection within the workplace and their reports on discrimination against HIV clients within health facilities. HIV care providers in Burkina Faso, Kenya and Uganda experienced substantial rewards from their work, including satisfaction from saving lives and gaining professional skills. They also faced serious resource constraints, including staff shortages, high workloads, lack of supplies and inadequate infrastructure, and they expressed concerns about accidental exposure. Health workers described heavy emotional demands from observing clients suffer emotional, social and health consequences of being diagnosed with HIV, and also from difficult ethical dilemmas related to clients who do not disclose their HIV status to those around them, including partners. These findings suggest that providers of HIV testing and counselling need more resources and support, including better protections against HIV exposure in the workplace. The findings also suggest that health facilities could improve care by increasing attention to consent, privacy and confidentiality and that health policy makers and ethicists need to address some unresolved ethical dilemmas related to confidentiality and non-disclosure, and translate those discussions into better guidance for health workers.

Medicines

33. Trop Med Int Health. 2015 Nov;20(11):1559-63

Antibiotic resistance of Streptococcus pneumoniae colonising the nasopharynx of HIV-exposed Tanzanian infants

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Objectives: To determine antibiotic susceptibility of colonising pneumococcal serotypes in HIV-exposed infants before the introduction of the 13-valent pneumococcal conjugate vaccine (PCV13), because HIV-exposed infants are at increased risk of invasive pneumococcal infections.

Methods: Antibiotic susceptibility of 104 pneumococcal isolates, cultured from the nasopharynx from Tanzanian HIV-exposed infants, was determined using the disc diffusion method and the E-test according to EUCAST version 4.0 (2014) criteria.

Results: A total of 69.2% of isolates were intermediately susceptible for benzyl penicillin (MIC 0.06-2 mg/l); no high-level resistance was found. All isolates but one were susceptible to ampicillin. Regarding non-beta-lactam antibiotics, 19.2% of isolates were resistant to doxycycline, 3.8% to erythromycin and 97.1% to trimethoprim/sulfamethoxazole. A total of 15.4% of isolates were resistant to three antibiotic classes or more. There were no differences in antibiotic susceptibility between vaccine and non-vaccine serotypes. Reduced susceptibility of colonising pneumococcal isolates for commonly used antibiotics is common in HIV-exposed Tanzanian infants.

Conclusions: High-dose penicillin and ampicillin remain appropriate first choices for non-meningeal pneumococcal infections in this group.

34. Clin Infect Dis. 2015 Oct 20. pii: civ881 [Epub ahead of print]

Impact of sulfadoxine-pyrimethamine resistance on effectiveness of intermittent preventive therapy for malaria in pregnancy at clearing infections and preventing low birth weight.

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Background: Monitoring the effectiveness of intermittent preventive therapy in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP) is crucial owing to increasing SP resistance in sub-Saharan Africa.

Methods: Between 2009 and 2013, both the efficacy of IPTp-SP at clearing existing peripheral malaria infections and the effectiveness of IPTp-SP at reducing low birthweight (LBW) were assessed among HIV-negative participants in 8 sites in 6 countries. Sites were classified as high, medium or low resistance after measuring mutations conferring SP resistance. An individual-level prospective pooled analysis was conducted.

Results: Among 1,222 parasitaemic pregnant women, overall PCR-uncorrected and -corrected failure rates by day 42 were 21.3% and 10.0%, respectively (39.7% and 21.1% in high-resistance areas; 4.9% and 1.1% in low-resistance areas). Median time to recurrence decreased with increasing prevalence of Pfdhps-K540E. Among 6,099 women at delivery, each incremental dose of IPTp-SP was associated with a 22% reduction in the risk of LBW (prevalence ratio [PR]=0.78 [95% CI 0.69-0.88], p<0.001). This association was not modified by insecticide-treated net use or gravidity, and remained significant in areas with SP resistance (PR=0.81 [0.67-0.97], p=0.02).

Conclusions: The efficacy of SP to clear peripheral parasites and prevent new infections during pregnancy is compromised in areas with >90% prevalence of Pfdhps-K540E. Nevertheless, in these high resistance areas, IPTp-SP use remains associated with increases in birthweight and maternal haemoglobin. The effectiveness of IPTp in eastern and southern Africa is threatened by further increases in SP-resistance and reinforces the need to evaluate alternative drugs and strategies for the control of malaria in pregnancy.

35. Lancet. 2015 Sep 28. pii: S0140-6736(15)00310-4. doi: 10.1016/S0140-6736(15)00310-4 [Epub ahead of print]

Intermittent screening and treatment or intermittent preventive treatment with dihydroartemisinin-piperaquine versus intermittent preventive treatment with sulfadoxine-pyrimethamine for the control of malaria during pregnancy in western Kenya: an open-label, three-group, randomised controlled superiority trial.

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Background: Every year, more than 32 million pregnancies in sub-Saharan Africa are at risk of malaria infection and its adverse consequences. The effectiveness of the intermittent preventive treatment with sulfadoxine-pyrimethamine strategy recommended by WHO is threatened by high levels of parasite resistance. We aimed to assess the efficacy and safety of two alternative strategies: intermittent screening with malaria rapid diagnostic tests and treatment of women who test positive with dihydroartemisinin-piperaquine, and intermittent preventive treatment with dihydroartemisinin-piperaquine.

Methods: We did this open-label, three-group, randomised controlled superiority trial at four sites in western Kenya with high malaria transmission and sulfadoxine-pyrimethamine resistance. HIV-negative pregnant women between 16 and 32 weeks' gestation were randomly assigned (1:1:1), via computer-generated permuted-block randomisation (block sizes of three, six, and nine), to receive intermittent screening and treatment with dihydroartemisinin-piperaquine, intermittent preventive treatment with dihydroartemisinin-piperaquine, or intermittent preventive treatment with sulfadoxine-pyrimethamine. Study participants, study clinic nurses, and the study coordinator were aware of treatment allocation, but allocation was concealed from study investigators, delivery unit nurses, and laboratory staff. The primary outcome was malaria infection at delivery, defined as a composite of peripheral or placental parasitaemia detected by placental histology, microscopy, or rapid diagnostic test. The primary analysis was by modified intention to treat. This study is registered with ClinicalTrials.gov, number NCT01669941.

Findings: Between Aug 21, 2012, and June 19, 2014, we randomly assigned 1546 women to receive intermittent screening and treatment with dihydroartemisinin-piperaquine (n=515), intermittent preventive treatment with dihydroartemisinin-piperaquine (n=516), or intermittent preventive treatment with sulfadoxine-pyrimethamine (n=515); 1368 (88%) women comprised the intention-to-treat population for the primary endpoint. Prevalence of malaria infection at delivery was lower in the intermittent preventive treatment with dihydroartemisinin-piperaquine group than in the intermittent preventive treatment with sulfadoxine-pyrimethamine group (15 [3%] of 457 women vs 47 [10%] of 459 women; relative risk 0·32, 95% CI 0·18-0·56; p<0·0001), but not in the intermittent screening and treatment with dihydroartemisinin-piperaquine group (57 [13%] of 452 women; 1·23, 0·86-1·77; p=0·26). Compared with intermittent preventive treatment with sulfadoxine-pyrimethamine, intermittent preventive treatment with dihydroartemisinin-piperaquine was associated with a lower incidence of malaria infection during pregnancy (192·0 vs 54·4 events per 100 person-years; incidence rate ratio [IRR] 0·28, 95% CI 0·22-0·36; p<0·0001) and clinical malaria during pregnancy (37·9 vs 6·1 events; 0·16, 0·08-0·33; p<0·0001), whereas intermittent screening and treatment with dihydroartemisinin-piperaquine was associated with a higher incidence of malaria infection (232·0 events; 1·21, 1·03-1·41; p=0·0177) and clinical malaria (53·4 events; 1·41, 1·00-1·98; p=0·0475). We recorded 303 maternal and infant serious adverse events, which were least frequent in the intermittent preventive treatment with dihydroartemisinin-piperaquine group. **Interpretation**: At current levels of rapid diagnostic test sensitivity, intermittent screening and treatment is not a suitable alternative to intermittent preventive treatment with sulfadoxine-pyrimethamine in the context of high sulfadoxine-pyrimethamine resistance and malaria transmission. However, dihydroartemisinin-piperaquine is a promising alternative drug to replace sulfadoxine-pyrimethamine for intermittent preventive treatment.

Future studies should investigate the efficacy, safety, operational feasibility, and cost-effectiveness of intermittent preventive treatment with dihydroartemisinin-piperaquine.

Sexual Reproductive Health

36. Trop Med Int Health. 2015;20(10):1258-64

Roles and responsibilities in newborn care in four African sites

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Objectives: To explore roles and responsibilities in newborn care in the intra- and postpartum period in Nigeria, Tanzania and Ethiopia.

Methods: Qualitative data were collected using in-depth interviews with mothers, grandmothers, fathers, health workers and birth attendants and were analysed through content and framework analyses.

Results: We found that birth attendants were the main decision-makers and care takers in the intrapartum period. Birth attendants varied across sites and included female relatives (Ethiopia and Nigeria), traditional birth attendants (Tanzania and Nigeria), spiritual birth attendants (Nigeria) and health workers (Tanzania and Nigeria). In the early newborn period, when the mother is deemed to be resting, female family members assumed this role. The mothers themselves only took full responsibility for newborn care after a few days or weeks. The early newborn period was protracted for first-time mothers, who were perceived as needing training on caring for the baby. Clear gender roles were described, with newborn care being considered a woman's domain. Fathers had little physical contact with the newborn, but played an important role in financing newborn care, and were considered the ultimate decision-maker in the family.

Conclusion: Interventions should move beyond a focus on the mother-child dyad, to include other carers who perform and decide on newborn care practices. Given this power dynamic, interventions that involve men have the potential to result in behaviour change.

37. BMJ 2015;351:h4206 Practice Uncertainties Page

When should the umbilical cord be clamped?

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The bottom line

In the light of current uncertainty:

For healthy term births, wait two to five minutes before clamping the cord or longer if the mother requests

For healthy preterm births, wait to clamp the cord for at least one minute or longer if the mother requests

For very preterm births not requiring immediate resuscitation, wrap the baby (without compressing the cord) before clamping the cord

For infants requiring immediate resuscitation at birth, do not delay resuscitation or delay transfer to the resuscitaire; the cord may need to be clamped to allow resuscitation

Record the time of cord clamping in the medical notes for all births

At birth, if the umbilical cord is not clamped immediately blood flow between the baby and placenta continues for a short time; this continued placental transfusion is part of the physiological transition from fetal to neonatal circulation. Clamping the cord too quickly may restrict the infant's ability to cope with this transition. Healthy babies at term usually adapt without major consequences, but this may affect wellbeing in those born preterm or with an impaired cardiorespiratory circulation. A brief delay in cord clamping may increase neonatal blood volume, but a longer delay may have other advantages, such as a smoother cardiorespiratory transition and more stable blood pressure, irrespective of net change in blood volume. For very preterm infants (<32 weeks' gestation), improved blood pressure stability may reduce the risk of intraventricular haemorrhage. Concerns about deferring (delaying) cord clamping include exacerbation of jaundice, increased blood viscosity owing to greater red cell mass, delayed respiratory support, and hypothermia.

There is no agreement on what constitutes early or deferred cord clamping.

38. Health Policy and Planning 2015;30(7):946–955

The effectiveness of community-based loan funds for transport during obstetric emergencies in developing countries: a systematic review.

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Objective: Scarcity and costs of transport have been implicated as key barriers to accessing care when obstetric emergencies occur in community settings. Community-based loans have been used to increase utilization of health facilities and potentially reduce maternal mortality by providing funding at community level to provide emergency transport. This review aimed to provide evidence of the effect of community-based loan funds on utilization of health facilities and reduction of maternal mortality in developing countries.

Methods: Electronic databases of published literature and websites were searched for relevant literature using a pre-defined set of search terms, inclusion and exclusion criteria. Screening of titles, abstracts and full-text articles were done by at least two reviewers independently. Quality assessment was carried out on the selected papers. Data related to deliveries and obstetric complications attended at facilities, maternal deaths and live births were extracted to measure and compare the effects of community-based loan funds using odds ratios (ORs) and reductions in maternal mortality ratio. Forest plots are presented where possible.

Results: The results of the review show that groups where community-based loan funds were implemented (alongside other interventions) generally recorded increases in utilization of health facilities for deliveries, with ORs of 3.5 (0.97–15.48) and

3.55 (1.56–8.05); and an increase in utilization of emergency obstetric care with ORs of 2.22 (0.51–10.38) and 3.37 (1.78–6.37). Intervention groups also experienced a positive effect on met need for complications and a reduction in maternal mortality.
Conclusion: There is some evidence to suggest that community-based loan funds as part of a multifaceted intervention have positive effects. Conclusions are limited by challenges of study design and bias. Further studies which strengthen the evidence of the effects of loan funds, and mechanism for their functionality, are recommended.

39. Reproductive Health Matters 2015;23(45):149-150

WHO Statement on caesarean section rates
World Health Organization Human Reproduction Programme, 10 April 2015
Editor's note: The key message of the statement below is that, rather than striving to achieve any specific rate of caesarean section, efforts should focus on ensuring delivery of caesarean sections to women in need. Caesarean section should only be conducted when medically necessary, as surgery such as this can cause complications, especially in settings that lack facilities or capacities to conduct safe surgery or treat complications. The implication of this message is that health care facilities should monitor caesarean section rates in a reliable way, for planning and quality control purposes. WHO proposes the Robson classification system (*The Robson system classifies all deliveries into one of ten groups on the basis of obstetric history, onset of labour, fetal lie, number of neonates, and gestational age.) as a global standard for assessing, monitoring and comparing caesarean section rates.
Since 1985, the international healthcare community has considered the ideal rate for caesarean sections to be between 10% and 15%. Since then, caesarean sections have become increasingly common in both developed and developing countries.
In recent years, governments and clinicians have expressed concern about the rise in the numbers of caesarean section births and the potential negative consequences for maternal and infant health. In addition, the international community has increasingly referenced the need to revisit the 1985 recommended rate.
Based on this available data, and using internationally accepted methods to assess the evidence with the most appropriate analytical techniques, WHO concludes:
1. Caesarean sections are effective in saving maternal and infant lives, but only when they are required for medically indicated reasons.
2. At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates.
3. Caesarean sections can cause significant and sometimes permanent complications, disability or death particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean sections should ideally only be undertaken when medically necessary.
4. Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate.
5. The effects of caesarean section rates on other outcomes, such as maternal and perinatal morbidity, paediatric outcomes, and psychological or social well-being, are still unclear. More research is needed to understand the health effects of caesarean section on immediate and future outcomes.

40. PLoS Med 2015;12(9):e1001881

Effectiveness of a Home-Based Counselling Strategy on Neonatal Care and Survival: A Cluster-Randomised Trial in Six Districts of Rural Southern Tanzania
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Background: We report a cluster-randomised trial of a home-based counselling strategy, designed for large-scale implementation, in a population of 1.2 million people in rural southern Tanzania. We hypothesised that the strategy would improve neonatal survival by around 15%.
Methods and Findings: In 2010 we trained 824 female volunteers to make three home visits to women and their families during pregnancy and two visits to them in the first few days of the infant's life in 65 wards, selected randomly from all 132 wards in six districts in Mtwara and Lindi regions, constituting typical rural areas in Southern Tanzania. The remaining wards were comparison areas. Participants were not blinded to the intervention. The primary analysis was an intention-to-treat analysis comparing the neonatal mortality (day 0–27) per 1,000 live births in intervention and comparison wards based on a representative survey in 185,000 households in 2013 with a response rate of 90%. We included 24,381 and 23,307 live births between July 2010 and June 2013 and 7,823 and 7,555 live births in the last year in intervention and comparison wards, respectively. We also compared changes in neonatal mortality and newborn care practices in intervention and comparison wards using baseline census data from 2007 including 225,000 households and 22,243 births in five of the six intervention districts. Amongst the 7,823 women with a live birth in the year prior to survey in intervention wards, 59% and 41% received at least one volunteer visit during pregnancy and postpartum, respectively. Neonatal mortality reduced from 35.0 to 30.5 deaths per 1,000 live births between 2007 and 2013 in the five districts, respectively. There was no evidence of an impact of the intervention on neonatal survival (odds ratio [OR] 1.1, 95% confidence interval [CI] 0.9–1.2, $p = 0.339$). Newborn care practices reported by mothers were better in intervention than in comparison wards, including immediate breastfeeding (42% of 7,287 versus 35% of 7,008, OR 1.4, CI 1.3–1.6, $p < 0.001$), feeding only breast milk for the first 3 d (90% of 7,557 versus 79% of 7,307, OR 2.2, 95% CI 1.8–2.7, $p < 0.001$), and clean hands for home delivery (92% of 1,351 versus 88% of 1,799, OR 1.5, 95% CI 1.0–2.3, $p = 0.033$). Facility delivery improved dramatically in both groups from 41% of 22,243 in 2007 and was 82% of 7,820 versus 75% of 7,553 (OR 1.5, 95% CI 1.2–2.0, $p = 0.002$) in intervention and comparison wards in 2013. Methodological limitations include our inability to rule out some degree of leakage of the intervention into the comparison areas and response bias for newborn care behaviours.

Conclusion: Neonatal mortality remained high despite better care practices and childbirth in facilities becoming common. Public health action to improve neonatal survival in this setting should include a focus on improving the quality of facility-based childbirth care.

Surgery

41. Lancet 2015;386(9993):569-624

Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development
Meara JG et al.
Despite growing need, the development and delivery of surgical and anaesthesia care in LMICs has been nearly absent from the global health discourse. Little has been written about the human and economic effect of surgical conditions, the state of surgical care, or the potential strategies for scale-up of surgical services in LMICs. To begin to address these crucial gaps in knowledge, policy, and action, the Lancet Commission on Global Surgery was launched in January, 2014. The Commission brought together an international, multidisciplinary team of 25 commissioners, supported by advisors and collaborators in more than 110 countries and six continents.
We formed four working groups that focused on the domains of health-care delivery and management; workforce, training, and education; economics and finance; and information management. Our Commission has five key messages, a set of indicators and recommendations to improve access to safe, affordable surgical and anaesthesia care in LMICs, and a template for a national surgical plan. Our five key messages are presented as follows:
• 5 billion people do not have access to safe, affordable
surgical and anaesthesia care when needed.
• 143 million additional surgical procedures are needed in LMICs each year to save lives and prevent disability.
• 33 million individuals face catastrophic health expenditure due to payment for surgery and anaesthesia care each year.
• Investing in surgical services in LMICs is affordable, saves lives, and promotes economic growth.
• Surgery is an "indivisible, indispensable part of health care."
In summary, the Commission's key findings show that the human and economic consequences of untreated surgical conditions in LMICs are large and for many years have gone unrecognised. During the past two decades, global health has focused on individual diseases. The development of integrated health services and health systems has been somewhat neglected. As such, surgical care has been afforded low priority in the world's poorest regions. Our report presents a clear challenge to this approach. As a new era of global health begins in 2015, the focus should be on the development of broad-based health-systems solutions, and resources should be allocated accordingly. Surgical care has an incontrovertible, cross-cutting role in achievement of local and global health challenges.
The provision of safe and affordable surgical and anaesthesia care when needed not only reduces premature death and disability, but also boosts welfare, economic productivity, capacity, and freedoms, contributing to long- term development. Our six core surgical indicators should be tracked and reported by all countries and global health organisations, such as the World Bank through the World Development Indicators, WHO through the Global Reference List of 100 Core Health Indicators, and entities tracking the SDGs.
The six core surgical indicators:

- Access to timely essential surgery
- Specialist surgical workforce density
- Surgical volume
- Perioperative mortality
- Protection against impoverishing expenditure
- Protection against catastrophic expenditure

42. Trop Med Int Health 2015;20(10):1329-36

Quality of anaesthesia for Caesarean sections: a cross-sectional study of a university hospital in a low-income country
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Objective: To evaluate the quality of anaesthesia for Caesarean sections at Muhimbili National Hospital, Dar es Salaam, Tanzania.
Method: We developed an instrument consisting of 40 quality indicators using an expert group process based on the existing literature. Using the instrument, we observed 50 Caesarean sections. Twenty-eight of the indicators were structural indicators, such as essential drugs, oxygen supply and anaesthetic equipment. Twelve were process indicators such as evaluation of airway, blood pressure assessment or insertion of an intravenous line.
Results: The median patient age was 28.5 years. A total of 75% (range 61-82%) of the structural indicators were present in the operating theatres, and 55% (range 33-83%) of the process indicators were performed. The neonates' median Apgar score was 9 (range 3-10). Seven babies required ventilation, four babies were stillborn, and all others were alive at follow-up 2 days after partus. All mothers were alive 2 days post-surgery.
Conclusion: The low process score suggests that quality improvement initiatives should focus on the processes of anaesthesia for Caesarean sections rather than new drugs and equipment.