# International Health Alerts 2015-3 Contents

## Communicable Diseases

1. TMIH 2015;20(8):1048-56

**Combining malaria control with house electrification: adherence to recommended behaviours for proper deployment of solar-powered mosquito trapping systems, Rusinga Island, western Kenya**

Oria PA, Alaii J, Ayugi M, et al

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**Objective**: To investigate community adherence to recommended behaviours for proper deployment of solar-powered mosquito trapping systems (SMoTS) after 3- to 10-week use.
**Methods**: Solar-powered mosquito trapping system, which also provided power for room lighting and charging mobile phones, were installed in houses in Rusinga Island, western Kenya. We used a structured checklist for observations and a semi-structured questionnaire for interviews in 24 homesteads. We also analysed the subject of 224 community calls to the project team for technical maintenance of SMoTS.
**Results**: Most respondents cared for SMoTS by fencing, emptying and cleaning the trap. Our observations revealed that most traps were fenced, clean and in good working condition. A significantly higher proportion of community calls was lighting-related. Lighting was the main reason respondents liked SMoTS because it reduced or eliminated expenditure on kerosene. However, some respondents observed they no longer heard sounds of mosquitoes inside their houses. All respondents reportedly slept under insecticide-treated nets (ITNs) before receiving SMoTS. After receiving SMoTS, most respondents reportedly continued to use ITNs citing that the project advised them to do so. Some beach residents stopped using ITNs because they no longer heard mosquitoes or due to heat discomfort caused by lights.
**Conclusion**: Electricity-related incentives played a greater role in encouraging adherence to recommended behaviours for proper deployment of SMoTS than the potential health benefits in the early stages of the intervention. Although energy-related financial incentives may play a role, they are insufficient to ensure adherence to health advice, even in the short term. Ongoing community engagement and research monitors and addresses adherence to recommended behaviours including continuation of current malaria control strategies.

2. TMIH 2015;20(9):1128-1145

**National tuberculosis prevalence surveys in Asia, 1990-2012: an overview of results and lessons learned**

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**Objective and methods**: In many countries, national tuberculosis (TB) prevalence surveys are the only way to reliably measure the burden of TB disease and monitor trends. They can also provide evidence about the current performance of TB care and control and how this could be improved. We developed an inventory of Asian surveys from 1953 to 2012 and then compiled and analysed a standard set of data for all national surveys implemented between 1990 (the baseline year for 2015 global TB targets) and 2012.
**Results**: There were 21 surveys in 12 countries between 1990 and 2012; published results were available for 18. The participation rate was at least 80% and often much higher except for two surveys in Thailand. The prevalence of bacteriologically-positive TB disease among adults aged ≥15 years varied widely among countries (1.2 per 1000 population in China in 2010 to 15 per 1000 population in Cambodia in 2002), but age and sex distribution patterns

were consistent with a progressive increase in rates of disease by age, and men accounting for 66-75% of prevalent cases. A high proportion of cases (40-79% across all surveys) did not report TB symptoms that met screening criteria (generally cough of 2-3 weeks or more, and blood in the sputum) and were only detected due to chest X-ray screening of all survey participants; this proportion increased over time in countries with repeat survey data. The ratio of prevalent cases to cases notified to national TB programmes was typically around two, but was as high as three in Lao PDR and Pakistan even after the internationally recommended TB control strategy had been implemented nationwide for several years. Four countries (China, Cambodia, the Republic of Korea and the Philippines demonstrated declines in smear or culture-positive pulmonary TB prevalence of approximately 50% over 10 years.
**Conclusions**: National TB prevalence surveys in Asia show that large reductions in the prevalence of TB disease can be achieved within a decade, that men bear much more of the burden than women and that the epidemic is ageing. Comparisons among countries show that more can be achieved in TB control in some countries with existing strategies and technologies. However, with many prevalent cases not reporting classic TB symptoms, all countries face the challenge of defining and implementing strategies that will result in earlier detection and treatment of cases.

3. TMIH 2015;20(9):1190-1195

**Schistosoma mansoni and HIV acquisition in fishing communities of Lake Victoria, Uganda: a nested case-control study**

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**Objective**: It has been suggested that Schistosoma mansoni, which is endemic in African fishing communities, might increase susceptibility to human immunodeficiency virus (HIV) acquisition. If confirmed, this would be of great public health importance in these high HIV-risk communities. This study was undertaken to determine whether S. mansoni infection is a risk factor for HIV infection among the fishing communities of Lake Victoria, Uganda. We conducted a matched case-control study, nested within a prospective HIV incidence cohort, including 50 HIV seroconverters (cases) and 150 controls during 2009-2011.
**Methods**: S. mansoni infection prior to HIV seroconversion was determined by measuring serum circulating anodic antigen (CAA) in stored serum. HIV testing was carried out using the Determine rapid test and infection confirmed by enzyme-linked immunosorbent assays.
**Results**: About 49% of cases and 52% of controls had S. mansoni infection prior to HIV seroconversion (or at the time of a similar study visit, for controls): odds ratio, adjusting for ethnicity, religion, marital status, education, occupation, frequency of alcohol consumption in previous 3 months, number of sexual partners while drunk, duration of stay in the community, and history of schistosomiasis treatment in the past 2 years was 1.23 (95% CI 0.3-5.7) P = 0.79. S. mansoni infections were chronic (with little change in status between enrolment and HIV seroconversion), and there was no difference in median CAA concentration between cases and controls.
**Conclusions**: These results do not support the hypothesis that S. mansoni infection promotes HIV acquisition.

4. Am J TMH 2015;93(1):125-34 doi: 10.4269/ajtmh.14-0254

**Review of Mass Drug Administration for Malaria and Its Operational Challenges.**

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Mass drug administration (MDA) was a component of many malaria programs during the eradication era, but later was seldomly deployed due to concerns regarding efficacy and feasibility and fear of accelerating drug resistance. Recently, however, there has been renewed interest in the role of MDA as an elimination tool. Following a 2013 Cochrane Review that focused on the quantitative effects of malaria MDA, we have conducted a systematic, qualitative review of published, unpublished, and gray literature documenting past MDA experiences. We have also consulted with field experts, using their historical experience to provide an informed, contextual perspective on the role of MDA in malaria elimination. Substantial knowledge gaps remain and more research is necessary, particularly on optimal target population size, methods to improve coverage, and primaquine safety. Despite these gaps, MDA has been used successfully to control and eliminate Plasmodium falciparum and P. vivax malaria in the past, and should be considered as part of a comprehensive malaria elimination strategy in specific settings.

5. Am J TMH 2015 Jul 8;93(1):33-9

**Temperature and the Field Stability of a Dengue Rapid Diagnostic Test in the Tropics.**
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The global incidence of dengue has increased significantly in recent decades, resulting in a large public health burden in tropical and subtropical countries. Dengue rapid diagnostic tests (RDTs) can provide accurate, rapid accessible diagnosis for patient management and may be easily used by health workers in rural areas. However, in dengue-endemic areas, ambient temperatures are often higher than manufacturer's recommendation. We therefore evaluated the effect of high temperature over time on the performance of one commonly used dengue RDT, the Standard Diagnostics Bioline Dengue Duo. RDTs were kept in five different conditions (at 4°C, 35°C, 45°C, 60°C, and at fluctuant ambient temperatures in a free-standing hut) for between 2 days and 2 years in the Lao People's Democratic Republic (PDR). RDTs were tested with four control sera (negative, dengue nonstructural protein 1 [NS1], anti-dengue immunoglobulin [Ig] M, and anti-dengue IgG positive). The RDTs had 100% consistency over the 2-year study, despite high temperatures, including in the hut in which temperatures exceeded the manufacturer's recommendations for 29% of time points. These data suggest that the diagnostic accuracy of the SD Bioline Dengue Duo RDT remains stable even after long-term storage at high temperatures. Therefore, use at such ambient temperatures in tropical areas should not jeopardize the dengue diagnostic outcome.

6. Am J TMH 2015 Aug 10. pii: 14-0834 [Epub ahead of print]

**Urban Malaria: Understanding its Epidemiology, Ecology, and Transmission Across Seven Diverse ICEMR Network Sites.**
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A major public health question is whether urbanization will transform malaria from a rural to an urban disease. However, differences about definitions of urban settings, urban malaria, and whether malaria control should differ between rural and urban areas complicate both the analysis of available data and the development of intervention strategies. This report examines the approach of the International Centers of Excellence for Malaria Research (ICEMR) to urban malaria in Brazil, Colombia, India (Chennai and Goa), Malawi, Senegal, and Uganda. Its major theme is the need to determine whether cases diagnosed in urban areas

were imported from surrounding rural areas or resulted from transmission within the urban area. If infections are being acquired within urban areas, malaria control measures must be targeted within those urban areas to be effective. Conversely, if malaria cases are being imported from rural areas, control measures must be directed at vectors, breeding sites, and infected humans in those rural areas. Similar interventions must be directed differently if infections were acquired within urban areas. The hypothesis underlying the ICEMR approach to urban malaria is that optimal control of urban malaria depends on accurate epidemiologic and entomologic information about transmission.

7. CI D 2015;60(12):1829-36

**Hepatitis C virus therapeutic development: in pursuit of "perfectovir".**

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The next decade will be a crucial period in the public health response to hepatitis C virus (HCV) infection. The rapid development of direct-acting antiviral (DAA) therapy for HCV infection has brought considerable optimism to the HCV sector, with the realistic hope that therapeutic intervention will soon provide near-optimal efficacy with well-tolerated short-duration, all-oral regimens. As the zenith in HCV therapeutic development approaches, there remain several key obstacles to the broad implementation of interferon-free DAA regimens. The extent of HCV screening and disease assessment, global and national public health prioritization, and drug pricing will determine the potential impact on disease burden derived from introduction of these exciting new HCV therapies. Public health partnerships and advocacy will be crucial to remove barriers to enhanced HCV treatment access.

8. Lancet 2015;386(9988):31-45

**Efficacy and safety of RTS,S/AS01 malaria vaccine with or without a booster dose in infants and children in Africa: final results of a phase 3, individually randomised, controlled trial**

RTS,S Clinical Trials Partnership

**Background**: The efficacy and safety of the RTS,S/AS01 candidate malaria vaccine during 18 months of follow-up have been published previously. Herein, we report the final results from the same trial, including the efficacy of a booster dose.
**Methods**: From March 27, 2009, until Jan 31, 2011, children (age 5-17 months) and young infants (age 6-12 weeks) were enrolled at 11 centres in seven countries in sub-Saharan Africa. Participants were randomly assigned (1:1:1) at first vaccination by block randomisation with minimisation by centre to receive three doses of RTS,S/AS01 at months 0, 1, and 2 and a booster dose at month 20 (R3R group); three doses of RTS,S/AS01 and a dose of comparator vaccine at month 20 (R3C group); or a comparator vaccine at months 0, 1, 2, and 20 (C3C [control group]). Participants were followed up until Jan 31, 2014. Cases of clinical and severe malaria were captured through passive case detection. Serious adverse events (SAEs) were recorded. Analyses were by modified intention to treat and per protocol. The coprimary endpoints were the occurrence of malaria over 12 months after dose 3 in each age category. In this final analysis, we present data for the efficacy of the booster on the occurrence of malaria. Vaccine efficacy (VE) against clinical malaria was analysed by negative binomial regression and against severe malaria by relative risk reduction. This trial is registered with ClinicalTrials.gov, number NCT00866619.
**Findings**: 8922 children and 6537 young infants were included in the modified intention-to-treat analyses. Children were followed up for a median of 48 months (IQR 39-50) and young

infants for 38 months (34-41) after dose 1. From month 0 until study end, compared with 9585 episodes of clinical malaria that met the primary case definition in children in the C3C group, 6616 episodes occurred in the R3R group (VE 36·3%, 95% CI 31·8-40·5) and 7396 occurred in the R3C group (28·3%, 23·3-32·9); compared with 171 children who experienced at least one episode of severe malaria in the C3C group, 116 children experienced at least one episode of severe malaria in the R3R group (32·2%, 13·7 to 46·9) and 169 in the R3C group (1·1%, -23·0 to 20·5). In young infants, compared with 6170 episodes of clinical malaria that met the primary case definition in the C3C group, 4993 episodes occurred in the R3R group (VE 25·9%, 95% CI 19·9-31·5) and 5444 occurred in the R3C group (18·3%, 11·7-24·4); and compared with 116 infants who experienced at least one episode of severe malaria in the C3C group, 96 infants experienced at least one episode of severe malaria in the R3R group (17·3%, 95% CI -9·4 to 37·5) and 104 in the R3C group (10·3%, -17·9 to 31·8). In children, 1774 cases of clinical malaria were averted per 1000 children (95% CI 1387-2186) in the R3R group and 1363 per 1000 children (995-1797) in the R3C group. The numbers of cases averted per 1000 young infants were 983 (95% CI 592-1337) in the R3R group and 558 (158-926) in the R3C group. The frequency of SAEs overall was balanced between groups. However, meningitis was reported as a SAE in 22 children: 11 in the R3R group, ten in the R3C group, and one in the C3C group. The incidence of generalised convulsive seizures within 7 days of RTS,S/AS01 booster was 2·2 per 1000 doses in young infants and 2·5 per 1000 doses in children.

**Interpretation**: RTS,S/AS01 prevented a substantial number of cases of clinical malaria over a 3-4 year period in young infants and children when administered with or without a booster dose. Efficacy was enhanced by the administration of a booster dose in both age categories. Thus, the vaccine has the potential to make a substantial contribution to malaria control when used in combination with other effective control measures, especially in areas of high transmission.

**Funding**: GlaxoSmithKline Biologicals SA and the PATH Malaria Vaccine Initiative.

## Non-Communicable Diseases

9. Lancet 2015;385(9981):1975-82

**Worldwide access to treatment for end-stage kidney disease: a systematic review.**

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**Background**: End-stage kidney disease is a leading cause of morbidity and mortality worldwide. Prevalence of the disease and worldwide use of renal replacement therapy (RRT) are expected to rise sharply in the next decade. We aimed to quantify estimates of this burden.

**Methods**: We systematically searched Medline for observational studies and renal registries, and contacted national experts to obtain RRT prevalence data. We used Poisson regression to estimate the prevalence of RRT for countries without reported data. We estimated the gap between needed and actual RRT, and projected needs to 2030.

**Findings**: In 2010, 2·618 million people received RRT worldwide. We estimated the number of patients needing RRT to be between 4·902 million (95% CI 4·438-5·431 million) in our conservative model and 9·701 million (8·544-11·021 million) in our high-estimate model, suggesting that at least 2·284 million people might have died prematurely because RRT could not be accessed. We noted the largest treatment gaps in low-income countries, particularly

Asia (1·907 million people needing but not receiving RRT; conservative model) and Africa (432,000 people; conservative model). Worldwide use of RRT is projected to more than double to 5·439 million (3·899-7·640 million) people by 2030, with the most growth in Asia (0·968 million to a projected 2·162 million [1·571-3·014 million]).
**Interpretation**: The large number of people receiving RRT and the substantial number without access to it show the need to both develop low-cost treatments and implement effective population-based prevention strategies.

## Health Policy

10. HPP (2015) 30 (4):432-441

**Removing user fees for facility-based delivery services: a difference-in-differences evaluation from ten sub-Saharan African countries**

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**Background**: Several countries in sub-Saharan Africa have recently adopted policies that remove user fees for facility-based delivery services. There is little rigorous evidence of the impact of these policies on utilization of delivery services and no evaluations have examined effects on neonatal mortality rates (NMR). In this article, we estimate the causal effect of removing user fees on the proportion of births delivered in facilities, the proportion of births delivered by Caesarean section, and NMR.
**Methods**: We used data from Demographic and Health Surveys conducted in 10 African countries between 1997 and 2012. Kenya, Ghana and Senegal adopted policies removing user fees for facility-based deliveries between 2003 and 2007, while seven other countries not changing user fee policies were used as controls. We used a difference-in-differences (DD) regression approach to control for secular trends in the outcomes that are common across countries and for time invariant differences between countries.
**Results**: According to covariate-adjusted DD models, the policy change was consistent with an increase of 3.1 facility-based deliveries per 100 live births (95% confidence interval (CI): 0.9, 5.2) and an estimated reduction of 2.9 neonatal deaths per 1000 births (95% CI: −6.8, 1.0). In relative terms, this corresponds to a 5% increase in facility deliveries and a 9% reduction in NMR. There was no evidence of an increase in Caesarean deliveries. We examined lead and lag-time effects, finding evidence that facility deliveries continued to increase following fee removal.
**Conclusions**: Our findings suggest removing user fees increased facility-based deliveries and possibly contributed to a reduction in NMR. Evidence from this evaluation may be useful to governments weighing the potential benefits of removing user fees.

11. HPP (2015) 30 (6):742-746

**Ten best resources on conditional cash transfers**

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The world's economy is in a fragile state. Although cautiously recovering from a global recession, unemployment rates and poverty levels remain high. At the same time, food and fuel crises have resulted in skyrocketing commodity costs, straining household budgets even further than before. In the wake of these financial pressure points, there has been increased

focus on social safety net programmes. More recently, Brazil's 'Bolsa Familia' conditional cash transfer (CCT) programme has celebrated its tenth-year anniversary, renewing focus on this particular aspect of social transfer programmes. This essay examines one particular aspect of these social safety net programmes: CCTs. CCT programmes are useful social programmes that have had demonstrable effects on many different populations. However, they are not a 'magic bullet' against poverty, and their image has suffered from unreasonable expectations of their impacts. This 10 best list is an ideal starting point from which a potential user can begin to understand CCTs. There remain significant gaps in the literature behind CCTs, with a particular need for much more research on emerging areas such as impacts on gender, long-term school and health outcomes, methods for increasing efficiency and adapting conditionalities within cultural contexts, among others. However, this list can function as a starting point from which the reader can gain an understanding and appreciation for what we believe to be one of the most innovative social programmes for addressing poverty worldwide.

12. HPP 2015:30(5):638-644

**Innovations in communication technologies for measles supplemental immunization activities: lessons from Kenya measles vaccination campaign, November 2012**

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**Background** To achieve a measles free world, effective communication must be part of all elimination plans. The choice of communication approaches must be evidence based, locally appropriate, interactive and community owned. In this article, we document the innovative approach of using house visits supported by a web-enabled mobile phone application to create a real-time platform for adaptive management of supplemental measles immunization days in Kenya.

**Methods** One thousand nine hundred and fifty-two Red Cross volunteers were recruited, trained and deployed to conduct house-to-house canvassing in 11 urban districts of Kenya. Three days before the campaigns, volunteers conducted house visits with a uniform approach and package of messages. All house visits were documented using a web-enabled mobile phone application (episurveyor®) that in real-time relayed information collected to all campaign management levels. During the campaigns, volunteers reported daily immunizations to their co-ordinators. Post-campaign house visits were also conducted within 4 days, to verify immunization of eligible children, assess information sources and detect adverse events following immunization.

**Results** Fifty-six per cent of the 164 643 households visited said that they had heard about the planned 2012 measles vaccination campaign 1–3 days before start dates. Twenty-five per cent of households were likely to miss the measles supplemental dose if they had not been reassured by the house visit. Pre- and post-campaign reasons for refusal showed that targeted communication reduced misconceptions, fear of injections and trust in herbal remedies. Daily reporting of immunizations using mobile phones informed changes in service delivery plans for better immunization coverage. House visits were more remembered (70%) as sources of information compared with traditional mass awareness channels like megaphones (41%) and radio (37%).

**Conclusions** In high-density settlements, house-to-house visits are easy and more penetrative compared with traditional media approaches. Using mobile phones to document campaign processes and outputs provides real time evidence for service delivery planning to improve immunization coverage.

13. HPP 2015:30(5):675-686

**Monitoring the ability to deliver care in low- and middle-income countries: a systematic review of health facility assessment tools**

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**Introduction** Health facilities assessments are an essential instrument for health system strengthening in low- and middle-income countries. These assessments are used to conduct health facility censuses to assess the capacity of the health system to deliver health care and to identify gaps in the coverage of health services. Despite the valuable role of these assessments, there are currently no minimum standards or frameworks for these tools.
**Methods** We used a structured keyword search of the MEDLINE, EMBASE and HealthStar databases and searched the websites of the World Health Organization, the World Bank and the International Health Facilities Assessment Network to locate all available health facilities assessment tools intended for use in low- and middle-income countries. We parsed the various assessment tools to identify similarities between them, which we catalogued into a framework comprising 41 assessment domains.
**Results** We identified 10 health facility assessment tools meeting our inclusion criteria, all of which were included in our analysis. We found substantial variation in the comprehensiveness of the included tools, with the assessments containing indicators in 13 to 33 (median: 25.5) of the 41 assessment domains included in our framework. None of the tools collected data on all 41 of the assessment domains we identified.
**Conclusions** Not only do a large number of health facility assessment tools exist, but the data they collect and methods they employ are very different. This certainly limits the comparability of the data between different countries' health systems and probably creates blind spots that impede efforts to strengthen those systems. Agreement is needed on the essential elements of health facility assessments to guide the development of specific indicators and for refining existing instruments.

14. PLoS Med 2015;12(6): e1001840

**Maximizing the Impact of Training Initiatives for Health Professionals in Low-Income Countries: Frameworks, Challenges, and Best Practices.**

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Summary Points:

- Historically, the impact of many health professional training initiatives in low-income countries has been limited by narrow focus on a small set of diseases, inefficient utilization of donor funding, inadequate scale up, insufficient emphasis on the acquisition of practical skills, poor alignment with local priorities, and lack of coordination.
- Fortunately, several innovative training initiatives have emerged over the past five years in sub-Saharan Africa. This articles focuses on four initiatives funded by the United States government: the Medical Education Training Partnership Initiative (MEPI), the Nursing Training Partnership Initiative (NEPI), the Rwanda Human Resources for Health Program (HRH Program), and the Global Health Service Partnership (GHSP).
- The best practices adopted by these initiatives are: alignment to local priorities, country ownership, competency-based training, institutional capacity building, and the establishment of long-lasting partnerships with international stakeholders,

Based on these best practices, we outline a framework for health professional training initiatives that can help better address the health workforce shortage in low-income countries.

15. Am J TMH 2015;93(1):159-67

**Assessing Drivers of Full Adoption of Test and Treat Policy for Malaria in Senegal.**

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Malaria treatment policy has changed from presumptive treatment to targeted "test and treat" (T&T) with malaria rapid diagnostic tests (RDTs) and artemisinin combination therapy (ACT). This transition involves changing behavior among health providers, meaning delays between introduction and full implementation are recorded in almost every instance. We investigated factors affecting successful transition, and suggest approaches for accelerating uptake of T&T. Records from 2000 to 2011 from health clinics in Senegal where malaria is mesoendemic were examined (96,166 cases). The study period encompassed the implementation of national T&T policy in 2006. Analysis showed that adherence to test results is the first indicator of T&T adoption and is dependent on accumulation of experience with positive RDTs (odds ratio [OR]: 0.55 [$P \leq 0.001$], 95% confidence interval [CI]: 0.53-0.58). Reliance on tests for malaria diagnosis (rather than presumptive diagnosis) followed after test adherence is achieved, and was also associated with increased experience with positive RDTs (OR: 0.60 [$P \leq 0.001$], 95% CI: 0.58-0.62). Logistic models suggest that full adoption of T&T clinical practices can occur within 2 years, that monitoring these behavioral responses rather than RDT or ACT consumption will improve evaluation of T&T uptake, and that accelerating T&T uptake by focusing training on adherence to test results will reduce overdiagnosis and associated health and economic costs in mesoendemic regions.

16. Lancet 2015 Jul 3. pii: S0140-6736(15)60251-3 [Epub ahead of print]

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

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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.

17. Lancet 2015 Jul 3. pii: S0140-6736(15)60252-5 [Epub ahead of print]

**Controversies in faith and health care**

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Differences in religious faith-based viewpoints (controversies) on the sanctity of human life, acceptable behaviour, health-care technologies and health-care services contribute to the widespread variations in health care worldwide. Faith-linked controversies include family planning, child protection (especially child marriage, female genital mutilation, and immunisation), stigma and harm reduction, violence against women, sexual and reproductive health and HIV, gender, end-of-life issues, and faith activities including prayer. Buddhism, Christianity, Hinduism, Islam, Judaism, and traditional beliefs have similarities and differences in their viewpoints. Improved understanding by health-care providers of the heterogeneity of viewpoints, both within and between faiths, and their effect on health care is important for clinical medicine, public-health programmes, and health-care policy. Increased appreciation in faith leaders of the effect of their teachings on health care is also crucial. This Series paper outlines some faith-related controversies, describes how they influence health-care provision and uptake, and identifies opportunities for research and increased interaction between faith leaders and health-care providers to improve health care.

18. BMJ 2015;350:h2340 News

**Countries are ill prepared to fight antimicrobial resistance, WHO says**

Gulland A

Three quarters of countries have no national plan to tackle antimicrobial resistance, despite such plans being seen as one of the most important components in combating the problem. A survey of 133 countries conducted by the World Health Organization in 2013 and 2014 found that just 34 had a comprehensive national plan to tackle antimicrobial resistance. The worst regions were WHO's Americas, Africa, and Eastern Mediterranean regions. In the Americas only three of 26 respondent countries had a national plan, and the figure was only one in eight in Africa and none at all in the Eastern Mediterranean region, which stretches from Morocco to Pakistan. That compared with 21 of 49 respondent countries in WHO's European region and five of 11 in its South East Asia region.

19. BMJ 2015;350:h2918 Editorials

**China's overuse of inpatient treatment and routine preoperative testing**

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Moving to day case management of most ocular surgery in China is possible

China's medical system is undergoing substantial reforms to improve access, efficiency, and quality of care. These changes have prompted recent suggestions in The BMJ on how efficiency could be further improved. Recommended reforms include reducing unnecessary use of intravenous fluid, currently estimated at eight bottles per capita annually, and restricting self medication with antibiotics for conditions such as flu, reported by a quarter of respondents in a recent survey by the China Food and Drug Administration.

Another opportunity for improved efficiency is to stop admitting patients to hospital for non-invasive surgical care, which is common practice in China. Taking ophthalmology as an example, a tertiary public eye hospital in China typically has between 100 and 500 beds.

20. BMJ 2015;350:h3046

**Should we welcome multinational companies' involvement in programmes to improve child health?**

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Pragmatic partnerships with industry can work argue Simon Berry and colleagues, but Nick Spencer thinks the conflicts of interest are too great

Yes—Simon Berry, Jane Berry, and Rohit Ramchandani

"Coca-Cola? We won't talk to them on principle." This response, from some of the big players in global finance and child health, surfaced immediately when we approached the Coca-Cola Company at the start of our journey. For decades, many have marvelled at Coca-Cola's distribution abilities, including those working to distribute essential drugs like oral rehydration salts and zinc. It is clear why. Ten years after the World Health Organization and Unicef recommended this treatment, worldwide less than 1% of children under 5 years with diarrhoea get it. Our mission with ColaLife was simple: collaborate across sectors to save as many children's lives as possible in poor countries by enabling access to essential drugs that are often out of stock in clinics, particularly in remote rural areas.

We thought we could learn from talking to multinationals, and three years later, in 2011, the independently funded public-private partnership we'd put together thought so too. It included Zambia's Ministry of Health, Unicef, pharmaceutical multinational Johnson & Johnson, local drugs company Pharmanova, drinks giant SABMiller, packaging experts PI Global and Amcor, the UK Department for International Development, and 20 non-governmental observers. We brought together global experts in design, market logistics, participatory consultation, public health, and monitoring and evaluation. We'd resolved that rather than condemn poor rural people to wait for free handouts we would offer them what the management professor C K Prahalad calls "the dignity of attention and choice."

Collaboration works

Within a year, our project had sold 26 000 kits to retailers serving rural communities in Zambia, and increased treatment rates with oral rehydration salts and zinc combination therapy from less than 1% to 45%.

21. BMJ 2015;351:h3759

**Feature Aid for Middle Income Countries; Downside of becoming a richer country**

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Since Vietnam graduated from low income to middle income status, donors have stopped supporting HIV/AIDS programmes and the government is struggling to fill the gap.

Getting richer has been a double edged sword for Vietnam. The country moved from low income to middle income status in 2010. Since then, aid it receives from the international community for programmes such as HIV/AIDS treatment has been dropping. That's troublesome given that Vietnam relies on donor support for about 75% of the budget for HIV services and the disease is spreading in its mountainous regions.

The World Bank and UK Department for International Development (DFID) were the first major donors to end existing HIV programmes in the country without making any plans for further support; others are following suit. In 2013, DFID finished a six year project that had provided a total of $36.5m (£24m; €33m), and in 2012 the World Bank wrapped up a $38.5m project that had spanned eight years.

Now the, US President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund are reportedly winding down their contributions as well. Launched in 2004, PEPFAR has given $634m to Vietnam's HIV response programme. But funding has dropped from $87m in

2010 to $69m in 2013 and $65m in 2014. Global Fund's total budget for HIV programmes in Vietnam is $77m for 2014-17.4 The fund hasn't announced the budget for after 2017, but local officials say they are not hopeful.

## HIV

22. IJE 2015:44(3):750-755

**Improving people's access to HIV treatment**

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About 30 million people living with HIV worldwide are eligible for antiretroviral therapy, but less than half of them have access to such treatment. To improve access, some low- and middle-income countries have moved delivery from hospitals to more peripheral health facilities, and have set up training and systems that mean antiretroviral therapy (ART) can be delivered by non-specialist healthcare workers. It is common sense that these approaches are likely to improve access, but some are concerned that they may result in healthcare workers with basic training managing complex and powerful medical treatments in more basic facilities: potentially causing harm. In this Cochrane Column, we highlight two Cochrane reviews that evaluate these policies and were subject to debate and recommendations in the World Health Organization (WHO) consolidated guidelines for antiretroviral treatment in 2013.

**Summary**: **Decentralization of HIV care from hospitals to lower levels of care**

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**Background**: Kredo and colleagues conducted a Cochrane Review to evaluate the effects of decentralizing HIV treatment and care in low- and middle-income countries. Decentralization of care broadly means relocating services from centralized facilities (hospitals) to peripheral health facilities or lower levels of health care, geographically closer to the homes of patients. The authors categorize decentralization into different categories: starting ART at the hospital and moving to a health centre to continue treatment ('partial decentralization'); starting and continuing ART at a health centre ('full decentralization'); and community care, where ART is started at a health centre and subsequently provided through a community clinic.

**Conclusion**: The review indicates that fewer patients are lost to care when they are continued on ART at health centres rather than in hospitals, and there is no evidence of worse outcomes. The review also did not detect a difference in the numbers of patients lost to care when they are treated in the community rather than in a health facility.

**Summary**: **Task shifting HIV care from doctors to non-doctors**

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**Background**: A Cochrane Review was conducted to evaluate the quality of initiation and maintenance of ART delivery in models that task-shift care from doctors to non-doctors.

**Conclusion**: The review found moderate quality evidence that shifting responsibility from doctors to adequately trained and supported nurses or community health workers for providing ART probably does not decrease the quality of care and may decrease the number of patients lost to follow-up.

23. PLoS Med 2015;12(6): e1001808

**HIV Programs for Sex Workers: Lessons and Challenges for Developing and Delivering Programs**

Wilson D, World Bank, Global HIV/AIDS Program, Washington. <wilson@worldbank.org>

There is evidence that HIV prevention programs for sex workers, especially female sex workers, are cost-effective in several contexts, including many western countries, Thailand, India, the Democratic Republic of Congo, Kenya, and Zimbabwe. The evidence that sex worker HIV prevention programs work must not inspire complacency but rather a renewed effort to expand, intensify, and maximize their impact. The PLOS Collection "Focus on Delivery and Scale: Achieving HIV Impact with Sex Workers" highlights major challenges to scaling-up sex worker HIV prevention programs, noting the following: sex worker HIV prevention programs are insufficiently guided by understanding of epidemic transmission dynamics, situation analyses, and programmatic mapping; sex worker HIV and sexually transmitted infection services receive limited domestic financing in many countries; many sex worker HIV prevention programs are inadequately codified to ensure consistency and quality; and many sex worker HIV prevention programs have not evolved adequately to address informal sex workers, male and transgender sex workers, and mobile- and internet-based sex workers. Based on the wider collection of papers, this article presents three major clusters of recommendations: (i) HIV programs focused on sex workers should be prioritized, developed, and implemented based on robust evidence; (ii) national political will and increased funding are needed to increase coverage of effective sex worker HIV prevention programs in low and middle income countries; and (iii) comprehensive, integrated, and rapidly evolving HIV programs are needed to ensure equitable access to health services for individuals involved in all forms of sex work.

24. Lancet 2015 30;385(9983):2173-82

**Cryptococcal meningitis screening and community-based early adherence support in people with advanced HIV infection starting antiretroviral therapy in Tanzania and Zambia: an open-label, randomised controlled trial**

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**Background**: Mortality in people in Africa with HIV infection starting antiretroviral therapy (ART) is high, particularly in those with advanced disease. We assessed the effect of a short period of community support to supplement clinic-based services combined with serum cryptococcal antigen screening.

**Methods**: We did an open-label, randomised controlled trial in six urban clinics in Dar es Salaam, Tanzania, and Lusaka, Zambia. From February, 2012, we enrolled eligible individuals with HIV infection (age ≥18 years, CD4 count of <200 cells per μL, ART naive) and randomly assigned them to either the standard clinic-based care supplemented with community support or standard clinic-based care alone, stratified by country and clinic, in permuted block sizes of ten. Clinic plus community support consisted of screening for serum cryptococcal antigen combined with antifungal therapy for patients testing antigen positive, weekly home visits for the first 4 weeks on ART by lay workers to provide support, and in Tanzania alone, re-screening for tuberculosis at 6-8 weeks after ART initiation. The primary endpoint was all-cause mortality at 12 months, analysed by intention to treat. This trial is registered with the International Standard Randomised Controlled Trial Number registry, number ISCRTN 20410413.

**Findings**: Between Feb 9, 2012, and Sept 30, 2013, 1001 patients were randomly assigned to clinic plus community support and 998 to standard care. 89 (9%) of 1001 participants in the clinic plus community support group did not receive their assigned intervention, and 11 (1%) of 998 participants in the standard care group received a home visit or a cryptococcal antigen screen rather than only standard care. At 12 months, 25 (2%) of 1001 participants in the clinic plus community support group and 24 (2%) of 998 participants in the standard care group had been lost to follow-up, and were censored at their last visit for the primary analysis. At 12 months, 134 (13%) of 1001 participants in the clinic plus community support group had died compared with 180 (18%) of 998 in the standard care group. Mortality was 28% (95% CI 10-43) lower in the clinic plus community support group than in standard care group (p=0·004).
**Interpretation**: Screening and pre-emptive treatment for cryptococcal infection combined with a short initial period of adherence support after initiation of ART could substantially reduce mortality in HIV programmes in Africa.

25. TMIH 2015;20(7):880-92

**Immunological failure of first-line and switch to second-line antiretroviral therapy among HIV-infected persons in Tanzania: analysis of routinely collected national data**

Vanobberghen FM et al., London School of Hygiene & Tropical Medicine, London, UK and Mwanza Intervention Trials Unit, National Institute for Medical Research, Mwanza, Tanzania

**Objectives**: Rates of first-line treatment failure and switches to second-line therapy are key indicators for national HIV programmes. We assessed immunological treatment failure defined by WHO criteria in the Tanzanian national HIV programme.
**Methods**: We included adults initiating first-line therapy in 2004-2011 with a pre-treatment CD4 count, and ≥6-months of follow-up. We assessed subhazard ratios (SHR) for immunological treatment failure, and subsequent switch to second-line therapy, using competing risks methods to account for deaths.
**Results**: Of 121 308 adults, 7% experienced immunological treatment failure, and 2% died without observed immunological treatment failure, over a median 1.7 years. The 6-year cumulative probability of immunological treatment failure was 19.0% (95% CI 18.5, 19.7) and of death, 5.1% (4.8, 5.4). Immunological treatment failure predictors included earlier year of treatment initiation (P < 0.001), initiation in lower level facilities (SHR = 2.23 [2.03, 2.45] for dispensaries vs. hospitals), being male (1.27 [1.19, 1.33]) and initiation at low or high CD4 counts (for example, 1.78 [1.65, 1.92] and 5.33 [4.65, 6.10] for <50 and ≥500 vs. 200-349 cells/mm(3) , respectively). Of 7382 participants in the time-to-switch analysis, 6% switched and 5% died before switching. Four years after immunological treatment failure, the cumulative probability of switching was 7.3% (6.6, 8.0) and of death, 6.8% (6.0, 7.6). Those who immunologically failed in dispensaries, health centres and government facilities were least likely to switch.
**Conclusions**: Immunological treatment failure rates and unmet need for second-line therapy are high in Tanzania; virological monitoring, at least for persons with immunological treatment failure, is required to minimise unnecessary switches to second-line therapy. Lower level government health facilities need more support to reduce treatment failure rates and improve second-line therapy uptake to sustain the benefits of increased coverage.

26. TMIH 2015;20(7):903-13

**'I was thinking too much': experiences of HIV-positive adults with common mental disorders and poor adherence to antiretroviral therapy in Zimbabwe**

Kidia K et al., Arnhold Global Health Institute, Icahn School of Medicine at Mount Sinai, New York, NY, USA

**Objective**: To document the lived experiences of people with both poor mental health and suboptimal adherence to antiretroviral therapy in high HIV prevalence settings.
**Methods**: In-depth qualitative interviews were conducted with 47 (female = 31) HIV-positive adults who scored above the cut-point on a locally validated scale for common mental disorders (CMDs). Purposive sampling was used to recruit participants with evidence of poor adherence. Six additional key informant interviews (female = 6) were conducted with healthcare workers. Data were collected and analysed inductively by an interdisciplinary coding team.
**Results**: The major challenges faced by participants were stressors (poverty, stigma, marital problems) and symptoms of CMDs ('thinking too much', changes to appetite and sleep, 'burdened heart' and low energy levels). Thinking too much, which appears closely related to rumination, was the symptom with the greatest negative impact on adherence to antiretroviral therapy among HIV-positive adults with CMDs. In turn, thinking too much was commonly triggered by the stressors faced by people living with HIV/AIDS, especially poverty. Finally, participants desired private counselling, access to income-generating activities and family engagement in mental health care.
**Conclusions**: Better understanding of the local expression of mental disorders and of underlying stressors can inform the development of culturally sensitive interventions to reduce CMDs and poor adherence to antiretroviral therapy.

27. CID 2015 Jun 10. pii: civ456 [Epub ahead of print]

**Establishment and Replenishment of the Viral Reservoir in Perinatally HIV-1-infected Children Initiating Very Early Antiretroviral Therapy**

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**Background**: Combination antiretroviral therapy (cART) generally suppresses the replication of the human immunodeficiency virus type 1 (HIV-1) but does not cure the infection, because proviruses persist in stable latent reservoirs. It has been proposed that low-level proviral reservoirs might predict longer virologic control after discontinuation of treatment. Our objective was to evaluate the impact of very early initiation of cART and temporary treatment interruption on the size of the latent HIV-1 reservoir in vertically infected children.
**Methods**: This retrospective study included 23 perinatally HIV-1-infected children who initiated very early treatment within 12 weeks after birth (n = 14), or early treatment between week 12 and 1 year (n = 9). We measured the proviral reservoir (CD4(+) T-cell-associated HIV-1 DNA) in blood samples collected beyond the first year of sustained virologic suppression.
**Results**: There is a strong positive correlation between the time to initiation of cART and the size of the proviral reservoir. Children who initiated cART within the first 12 weeks of life showed a proviral reservoir 6-fold smaller than children initiating cART beyond this time ($P < .01$). Rapid virologic control after initiation of cART also limits the size of the viral reservoir. However, patients who underwent transient treatment interruptions showed a dramatic increase in the size of the viral reservoir after discontinuation.
**Conclusions**: Initiation of cART during the first 12 weeks of life in perinatally HIV-1-infected children limits the size of the viral reservoir. Treatment interruptions should be undertaken with caution, as they might lead to fast and irreversible replenishment of the viral reservoir.

28. CID 2015 1;60 Suppl 3:S182-6

**Starter packs versus full prescription of antiretroviral drugs for postexposure prophylaxis: a systematic review**

Ford N et al, Department of HIV/AIDS, World Health Organization, Geneva, Switzerland

**Background**: The provision of starter packs for human immunodeficiency virus postexposure prophylaxis (PEP) is practiced in many settings to facilitate rapid initiation by nonexperts and encourage adherence. However, the impact of starter packs on PEP completion rates has not been systematically assessed. We systematically reviewed the evidence on outcomes associated with starter packs for PEP compared to full prescriptions.
**Methods**: Four databases and 2 conference abstract sites were searched up to December 2013; this search was updated in 1 database in June 2014. PEP completion rates, stratified by prescribing practice, were pooled using random-effects meta-analysis.
**Results**: Fifty-four studies provided data on 11 714 PEP initiations. Thirty-seven studies, including 3 randomized controlled trials (RCTs) and 34 observational cohorts, provided information on starter packs (although none of the RCTs specifically assessed starter packs), and 17 studies, including 2 RCTs and 15 observational cohorts, provided information on full prescriptions. Overall, outcomes were better when participants were offered a full 28-day course of PEP at initial presentation to healthcare, with fewer refusals (11.4% [95% confidence interval {CI}, 5.3%-17.5%] vs 22% [95% CI, 16.7%-28.1%]) and higher completion rates (70% [95% CI, 56.7%-77.3%] vs 53.2% [95% CI, 44.4%-62.2%]). More than a quarter (28% [95% CI, 21.4%-34.5%]) of individuals provided with a PEP starter pack failed to return for their subsequent appointment and therefore defaulted prior to receiving a full course of PEP. The quality of the evidence overall was rated as very low.
**Conclusions**: The findings of this review suggest that starter packs do not improve adherence to PEP and may result in lower adherence and completion rates.

29. CID 2015 1;60 Suppl 3:S161-4

**World Health Organization Guidelines on Postexposure Prophylaxis for HIV: Recommendations for a Public Health Approach**

Ford N et al, Department of HIV/AIDS, World Health Organization, Geneva, Switzerland

The 2014 World Health Organization (WHO) guidelines for postexposure prophylaxis (PEP) developed recommendations for PEP irrespective of exposure source in recognition of the need to simplify eligibility assessment and prescribing practices. Traditionally, separate PEP guidelines have been developed according to exposure type, with difference guidelines for occupational exposure, nonoccupational exposure, and sexual assault. Recognizing the need to improve uptake and completion rates for PEP, the WHO 2014 guideline does not differentiate between exposure sources, but rather provides recommendations across all exposures. Recommendations for simplifying prescribing approaches and supporting adherence are also provided. In translating this guidance into national PEP guidelines, countries are encouraged to consider the need to provide PEP in a way that maximizes uptake and completion rates.

30. CID 2015 Jun 1;60(11):1715-21

**Impact of the Timing of Initiation of Antiretroviral Therapy During Primary HIV-1 Infection on the Decay of Cell-Associated HIV-DNA**

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**Background**: Combined antiretroviral therapy (cART) initiation during primary human immunodeficiency virus (HIV) infection (PHI) yields a larger decrease in cell-associated HIV-DNA (CA-HIV-DNA) than initiation during the chronic phase. Our objective was to model the short and long-term decay of CA-HIV-DNA blood reservoir in patients initiating cART during PHI and to assess the impact of the timing of cART initiation on CA-HIV-DNA decay.
**Methods**: We included patients enrolled during PHI in the Agence Nationale de Recherche sur le Sida PRIMO cohort, treated within the month following enrollment and achieving sustained virologic response. The decay of CA-HIV-DNA over time while on successful cART was modeled with a 3-slope linear mixed-effects model according to the delay between estimated date of infection and cART initiation.
**Results**: Three hundred twenty-seven patients were included, accounting for 1305 CA-HIV-DNA quantifications. Median time between infection and cART initiation was 41 days (interquartile range, 33-54 days). Median follow-up under cART was 2.3 years (range, 0.4-16.6 years). The timing of cART initiation had significant impact on the first slope of decrease: The earlier cART was initiated after HIV infection, the faster CA-HIV-DNA level decreased during the first 8 months of cART: -0.171, -0.131, and -0.068 log10 copies/10(6) peripheral blood mononuclear cells (PBMCs) per month when cART was initiated 15 days, 1 month, and 3 months after infection, respectively ($P < .0001$). The predicted mean CA-HIV-DNA level achieved after 5 years of successful cART was 1.62 and 2.24 log10 copies/10(6) PBMCs when cART was initiated 15 days and 3 months after infection, respectively ($P = .0006$).
**Conclusions**: This study provides strong arguments in favor of cART initiation at the earliest possible time point after HIV infection.

## Medicines

31. IJE 2015:44(3):978-987

**Antibiotic treatment of diarrhoea is associated with decreased time to the next diarrhoea episode among young children in Vellore, India**

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**Background** Antibiotics are commonly given for the treatment of childhood diarrhoea, but are not indicated in most cases. Antibiotics modify the gastrointestinal microbiota, which may have unanticipated effects on the risk of subsequent diarrhoea.
**Methods** In a prospective observational cohort study, we assessed the effect of caregiver-reported antibiotic treatment for diarrhoea on the timing of a child's next episode among 434 children followed from birth to 3 years of age in Vellore, India. We estimated median time differences and time ratios from inverse probability of exposure-weighted Kaplan-Meier curves for the time to next diarrhoea episode, comparing children who did and did not receive antibiotics for the previous episode.
**Results** Study children had more than five diarrhoea episodes on average in the first 3 years of life, and more than a quarter of all episodes were treated with antibiotics. Children who received antibiotics for their first diarrhoea episode had their second episode on average 8 weeks earlier (median time difference: −8, 95% confidence interval: −10, −3) than children who did not receive antibiotics. The effects of antibiotics on subsequent diarrhoea were

greatest at earlier episodes and younger ages, and cefixime had a slightly larger effect compared with cotrimoxazole.
**Conclusions** Antibiotic treatment of diarrhoea was associated with reduced time to a subsequent diarrhoea episode, especially among younger infants. Whereas rational use of antibiotics has been advocated to reduce antimicrobial resistance in populations, we show that overuse of antibiotics may also have a direct adverse effect on individual patients.

## 32. Special June Supplement Am J TMH

- Hajjou M, et al
  Monitoring the quality of medicines: results from Africa, Asia, and South America

- Attaran A
  Stopping murder by medicine: introducing the Model Law on Medicine Crime. Am J Trop Med Hyg. 2015

- Lalani M, et al
  Substandard antimalarials available in Afghanistan: a case for assessing the quality of drugs in resource poor settings

- Yong YL, et al
  Collaborative health and enforcement operations on the quality of antimalarials and antibiotics in southeast Asia

- Renschler et al
  Estimated under-five deaths associated with poor-quality antimalarials in sub-Saharan Africa

- Fadeyi I, et al
  Quality of the antibiotics--amoxicillin and co-trimoxazole from Ghana, Nigeria, and the United Kingdom

- Green MD, et al
  Integration of novel low-cost colorimetric, laser photometric, and visual fluorescent techniques for rapid identification of falsified medicines in resource-poor areas: application to artemether-lumefantrine

- ACT Consortium Drug Quality Project Team and the IMPACT2 Study Team
  Quality of Artemisinin-Containing Antimalarials in Tanzania's Private Sector. Results from a Nationally Representative Outlet Survey

- Yeung S, et al
  Quality of antimalarials at the epicenter of antimalarial drug resistance: results from an overt and mystery client survey in Cambodia

- Tabernero P, et al
  A Repeat Random PDR: A Change for the Better

- Ho NT, et al
  Rapid and specific drug quality testing assay for artemisinin and its derivatives using a luminescent reaction and novel microfluidic technology

- Nayyar GM, et al
  Responding to the pandemic of falsified medicines

- Mackey TK, et al
  Counterfeit drug penetration into global legitimate medicine supply chains: a global assessment

- Kaur H, et al
  Chemical and bioassay techniques to authenticate quality of the anti-leishmanial drug miltefosine

## Mental Health

33. PLoS Med 2015;12(6): e1001834

**Assessing Development Assistance for Mental Health in Developing Countries: 2007–2013.**

Gilbert BJ, et al. Corresponding author: <Chunling_Lu@hms.harvard.edu>

Summary Points

- Mental disorders are a leading cause of the global burden of disease, and the provision of mental health services in developing countries remains very limited and far from equitable.
- Using the Creditor Reporting System, we estimate the amounts and patterns of development assistance for global mental health (DAMH) between 2007 and 2013. This allows us to examine how well international donors have responded to calls by global mental health advocates to scale up evidence-based services.
- Although DAMH did increase between 2007 and 2013, it remains low both in absolute terms and as a proportion of total development assistance for health (DAH). The average annual DAMH between 2007 and 2013 was US$133.57 million, and the proportion of DAH attributed to mental health is less than 1%.
- Approximately 48% of total DAMH was for humanitarian assistance, education, and civil services. More annual DAMH was channelled into the nonpublic sector than the public sector.
- Despite an expanding body of evidence suggesting that sustainable mental health care can be effectively integrated into existing health systems at relatively low cost, mental health has not received significant development assistance.

## Research Methods

34. BMJ 2015;351:h3084

**Performance of alternative strategies for primary cervical cancer screening in sub-Saharan Africa: systematic review and meta-analysis of diagnostic test accuracy studies**

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**Objective**: To assess and compare the accuracy of visual inspection with acetic acid (VIA), visual inspection with Lugol's iodine (VILI), and human papillomavirus (HPV) testing as alternative standalone methods for primary cervical cancer screening in sub-Saharan Africa.
**Design**: Systematic review and meta-analysis of diagnostic test accuracy studies.
Data sources: Systematic searches of multiple databases including Medline, Embase, and Scopus for studies published between January 1994 and June 2014.
**Review methods**: Inclusion criteria for studies were: alternative methods to cytology used as a standalone test for primary screening; study population not at particular risk of cervical cancer (excluding studies focusing on HIV positive women or women with gynaecological symptoms); women screened by nurses; reference test (colposcopy and directed biopsies) performed at least in women with positive screening results. Two reviewers independently screened studies for eligibility and extracted data for inclusion, and evaluated study quality using the quality assessment of diagnostic accuracy studies 2 (QUADAS-2) checklist. Primary outcomes were absolute accuracy measures (sensitivity and specificity) of screening tests to detect cervical intraepithelial neoplasia grade 2 or worse (CIN2+).
**Results**: 15 studies of moderate quality were included (n=61 381 for VIA, n=46 435 for VILI, n=11 322 for HPV testing). Prevalence of CIN2+ did not vary by screening test and ranged from 2.3% (95% confidence interval 1.5% to 3.3%) in VILI studies to 4.9% (2.7% to 7.8%) in HPV testing studies. Positivity rates of VILI, VIA, and HPV testing were 16.5% (9.8% to 24.7%), 16.8% (11.0% to 23.6%), and 25.8% (17.4% to 35.3%), respectively. Pooled sensitivity was higher for VILI (95.1%; 90.1% to 97.7%) than VIA (82.4%; 76.3% to 87.3%) in studies where the reference test was performed in all women (P<0.001). Pooled specificity of VILI and VIA were similar (87.2% (78.1% to 92.8%) v 87.4% (77.1% to 93.4%); P=0.85). Pooled sensitivity and specificity were similar for HPV testing versus VIA (both P≥0.23) and versus VILI (both P≥0.16). Accuracy of VIA and VILI increased with sample size and time period.
**Conclusions**: For primary screening of cervical cancer in sub-Saharan Africa, VILI is a simple and affordable alternative to cytology that demonstrates higher sensitivity than VIA. Implementation studies are needed to assess the effect of these screening strategies on the incidence and outcomes of cervical cancer in the region.

35. BMJ 2015;351:h3267

**Evidence based community mobilization for dengue prevention in Nicaragua and Mexico (Camino Verde, the Green Way): cluster randomized controlled trial**

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**Objective**: To test whether community mobilization adds effectiveness to conventional dengue control.
**Design**: Pragmatic open label parallel group cluster randomized controlled trial. Those assessing the outcomes and analyzing the data were blinded to group assignment. Centralized computerized randomization after the baseline study allocated half the sites to intervention, stratified by country, evidence of recent dengue virus infection in children aged 3-9, and vector indices.
**Setting**: Random sample of communities in Managua, capital of Nicaragua, and three coastal regions in Guerrero State in the south of Mexico.
Participants: Residents in a random sample of census enumeration areas across both countries: 75 intervention and 75 control clusters (about 140 households each) were randomized and analyzed (60 clusters in Nicaragua and 90 in Mexico), including 85 182 residents in 18 838 households.

**Interventions**: A community mobilization protocol began with community discussion of baseline results. Each intervention cluster adapted the basic intervention—chemical-free prevention of mosquito reproduction—to its own circumstances. All clusters continued the government run dengue control program.
**Main outcome measures**: Primary outcomes per protocol were self reported cases of dengue, serological evidence of recent dengue virus infection, and conventional entomological indices (house index: households with larvae or pupae/households examined; container index: containers with larvae or pupae/containers examined; Breteau index: containers with larvae or pupae/households examined; and pupae per person: pupae found/number of residents). Per protocol secondary analysis examined the effect of Camino Verde in the context of temephos use.
**Results**: With cluster as the unit of analysis, serological evidence from intervention sites showed a lower risk of infection with dengue virus in children (relative risk reduction 29.5%, 95% confidence interval 3.8% to 55.3%), fewer reports of dengue illness (24.7%, 1.8% to 51.2%), fewer houses with larvae or pupae among houses visited (house index) (44.1%, 13.6% to 74.7%), fewer containers with larvae or pupae among containers examined (container index) (36.7%, 24.5% to 44.8%), fewer containers with larvae or pupae among houses visited (Breteau index) (35.1%, 16.7% to 55.5%), and fewer pupae per person (51.7%, 36.2% to 76.1%). The numbers needed to treat were 30 (95% confidence interval 20 to 59) for a lower risk of infection in children, 71 (48 to 143) for fewer reports of dengue illness, 17 (14 to 20) for the house index, 37 (35 to 67) for the container index, 10 (6 to 29) for the Breteau index, and 12 (7 to 31) for fewer pupae per person. Secondary per protocol analysis showed no serological evidence of a protective effect of temephos.
**Conclusions**: Evidence based community mobilization can add effectiveness to dengue vector control. Each site implementing the intervention in its own way has the advantage of local customization and strong community engagement.

36. BMJ 2015;351:h3740

**The ring vaccination trial: a novel cluster randomised controlled trial design to evaluate vaccine efficacy and effectiveness during outbreaks, with special reference to Ebola**

Ebola ça suffit ring vaccination trial consortium. Ana Maria Henao-Restrepo, Department of Immunization, Vaccines and Biologicals, World Health Organization, 1211 Geneva 27, Switzerland henaorestrepoa@who.int

A World Health Organization expert meeting on Ebola vaccines proposed urgent safety and efficacy studies in response to the outbreak in West Africa. One approach to communicable disease control is ring vaccination of individuals at high risk of infection due to their social or geographical connection to a known case. This paper describes the protocol for a novel cluster randomised controlled trial design which uses ring vaccination.
In the Ebola ça suffit ring vaccination trial, rings are randomised 1:1 to (a) immediate vaccination of eligible adults with single dose vaccination or (b) vaccination delayed by 21 days. Vaccine efficacy against disease is assessed in participants over equivalent periods from the day of randomisation. Secondary objectives include vaccine effectiveness at the level of the ring, and incidence of serious adverse events.
Ring vaccination trials are adaptive, can be run until disease elimination, allow interim analysis, and can go dormant during inter-epidemic periods.
Key points:
Evaluating the efficacy of novel vaccines and therapeutics in epidemics is challenging, with situations evolving rapidly and ethical concerns about research during public health emergencies

Ring vaccination around cases was used successfully in the smallpox eradication programme
A novel cluster randomised control trial of immediate versus 21 day delayed ring vaccination against Ebola is underway in Guinea
A ring vaccination trial tracks the epidemic, recruiting individuals at raised risk of infection due to their connection to a case: this design may both contribute to transmission interruption and have a higher power to detect vaccine efficacy than other study designs.

## Sexual Reproductive Health

37. PLoS Med 2015;12(6): e1001847

**The Mistreatment of Women during PLoS Med 12(6): e1001847 Childbirth in Health Facilities Globally: A Mixed-Methods Systematic Review.**

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**Background**: Despite growing recognition of neglectful, abusive, and disrespectful treatment of women during childbirth in health facilities, there is no consensus at a global level on how these occurrences are defined and measured. This mixed-methods systematic review aims to synthesize qualitative and quantitative evidence on the mistreatment of women during childbirth in health facilities to inform the development of an evidence-based typology of the phenomenon.
**Methods and Findings**: We searched PubMed, CINAHL, and Embase databases and grey literature using a predetermined search strategy to identify qualitative, quantitative, and mixed-methods studies on the mistreatment of women during childbirth across all geographical and income-level settings. We used a thematic synthesis approach to synthesize the qualitative evidence and assessed the confidence in the qualitative review findings using the CERQual approach. In total, 65 studies were included from 34 countries. Qualitative findings were organized under seven domains: (1) physical abuse, (2) sexual abuse, (3) verbal abuse, (4) stigma and discrimination, (5) failure to meet professional standards of care, (6) poor rapport between women and providers, and (7) health system conditions and constraints. Due to high heterogeneity of the quantitative data, we were unable to conduct a meta-analysis; instead, we present descriptions of study characteristics, outcome measures, and results. Additional themes identified in the quantitative studies are integrated into the typology.
**Conclusions**: This systematic review presents a comprehensive, evidence-based typology of the mistreatment of women during childbirth in health facilities, and demonstrates that mistreatment can occur at the level of interaction between the woman and provider, as well as through systemic failures at the health facility and health system levels. We propose this typology be adopted to describe the phenomenon and be used to develop measurement tools and inform future research, programs, and interventions.

38. RHM Vol. 22, (44), Suppl. 1, 1-3

**Special Theme: Expanding access to medical abortion**
Editorial (Abridged)
**Expanding access to medical abortion: challenges and opportunities**

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Medical abortion using mifepristone and misoprostol (or misoprostol alone in settings where mifepristone has not yet been approved or made available) is a safe and effective method of terminating both early and later pregnancies. Misoprostol tablets can also be used to manage incomplete abortion and miscarriage. When used in early pregnancy, medical abortion can be provided at a primary care facility and by non-physician providers. The over three decades long experience with these medications has also provided incremental evidence that many components of early medical abortion can safely take place outside of a facility setting as well, starting with women taking the mifepristone in the clinic and using the misoprostol at home, then also allowing the mifepristone to be taken at home. There are now various efforts going into helping women to check if the pregnancy is complete from home too, as the papers in this supplement show. As the evidence has accumulated, it is also reshaping our understanding and interpretation of the World Health Organization (WHO) definition of unsafe abortion, to account for the fact that "the persons, skills and medical standards considered safe in the provision of abortion are different for medical and surgical abortion". Yet, translating global evidence into local reality remains challenging. Several of the papers in this supplement examine these barriers by studying the knowledge and perspectives of providers and women − both in contexts where legal abortion is restricted to only a few indications (e.g. Argentina, Zimbabwe) and in those that allow abortion on a broad range of grounds (e.g. Cambodia, India, Nepal, Turkey). Across these diverse settings, the common thread is the lack of accurate knowledge. The findings, taken collectively, indicate that scientifically accurate knowledge about medical abortion, appropriate regimes and management of the process are not widespread – even in settings where medical abortion is legal and even among providers who are already providing medical abortion. Medical school curricula, even for ob-gyn students, do not always include medical abortion within the training. Across settings, reliable sources of information for providers, especially those working outside of large urban hospitals, remains limited, with the result that knowledge – even of evidence-based national guidelines – does not seem to percolate down to many providers or to influence their practice. Thus, use of obsolete methods, like sharp curettage, persists − as was noted in Colombia by Rodriguez et al and in Zimbabwe by Maternowska et al.

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Both successful and not so successful efforts need to be rigorously documented, as the paucity of monitoring and evaluation data continues to hamper efforts at scaling up and transferring lessons from one context to another.

Research findings are only the first step in bringing about programme and policy change. Attributing impact to the findings of a single study is difficult as most changes happen as a result of multiple factors. Dissemination of study results has to be followed by specific strategy and action related to translating the knowledge into implementation and advocating for change. Most of the researchers featured in this supplement have continued to work with the their study findings and with others in their countries in order to effect such change. The work reported by Louie et al is a good example of how research supported the inclusion of first trimester medical abortion into reproductive health services for women in Armenia and led to a working group being convened which developed national guidelines on medical abortion provision based on the study's findings.

In conclusion, when faced with an unwanted or unintended pregnancy, women will continue to seek ways to end the pregnancy, safely or unsafely. While concerns about the unregulated

use of these medicines may be valid, increasing availability through a graded scale-up that involves rationalization of procedures and providers and meets women's needs is the surest way to increase safety and safeguard against unregulated use. The vast evidence on the simplicity, safety and efficacy of medical abortion makes it ideally suited to expanding access to both safe abortion care and to care for post-abortion complications.

39. Lancet 2015;385(9985):2392-8

**Comparison of treatment of incomplete abortion with misoprostol by physicians and midwives at district level in Uganda: a randomised controlled equivalence trial**

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**Background**: Misoprostol is established for the treatment of incomplete abortion but has not been systematically assessed when provided by midwives at district level in a low-resource setting. We investigated the effectiveness and safety of midwives diagnosing and treating incomplete abortion with misoprostol, compared with physicians.
**Methods**: We did a multicentre randomised controlled equivalence trial at district level at six facilities in Uganda. Eligibility criteria were women with signs of incomplete abortion. We randomly allocated women with first-trimester incomplete abortion to clinical assessment and treatment with misoprostol either by a physician or a midwife. The randomisation (1:1) was done in blocks of 12 and was stratified for study site. Primary outcome was complete abortion not needing surgical intervention within 14-28 days after initial treatment. The study was not masked. Analysis of the primary outcome was done on the per-protocol population with a generalised linear-mixed effects model. The predefined equivalence range was -4% to 4%. The trial was registered at ClinicalTrials.gov, number NCT01844024.
**Findings**: From April 30, 2013, to July 21, 2014, 1108 women were assessed for eligibility. 1010 women were randomly assigned to each group (506 to midwife group and 504 to physician group). 955 women (472 in the midwife group and 483 in the physician group) were included in the per-protocol analysis. 452 (95·8%) of women in the midwife group had complete abortion and 467 (96·7%) in the physician group. The model-based risk difference for midwife versus physician group was -0·8% (95% CI -2·9 to 1·4), falling within the predefined equivalence range (-4% to 4%). The overall proportion of women with incomplete abortion was 3·8% (36/955), similarly distributed between the two groups (4·2% [20/472] in the midwife group, 3·3% [16/483] in the physician group). No serious adverse events were recorded.
**Interpretation**: Diagnosis and treatment of incomplete abortion with misoprostol by midwives is equally safe and effective as when provided by physicians, in a low-resource setting. Scaling up midwives' involvement in treatment of incomplete abortion with misoprostol at district level would increase access to safe post-abortion care.

40. TMIH 2015;20(7):934-40

**Women's perceptions of the quality of emergency obstetric care in a referral hospital in rural Tanzania**

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**Objectives**: To assess perceptions of the quality of obstetric care of women who delivered in a rural Tanzanian referral hospital.

**Methods**: A descriptive-exploratory qualitative study, using semistructured in-depth interviews and participatory observation. Nineteen recently delivered women and 3 health workers were interviewed.
**Results**: Although most women held positive views about the care they received in hospital, several participants expressed major concerns about negative attitudes of healthcare workers. Lack of medical communication given by care providers constituted a major complaint.
**Conclusions**: A more positive attitude by health workers and the provision of adequate medical information may promote a more positive hospital experience of women in need of obstetric care and enhance attendance.