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Review Article: Medical Considerations before International Travel

Communicable Diseases

1. Am J TMH 2016 Jul 6;95(1):88-91

A Case of Lagochilascariasis in Suriname with the Involvement of the ENT System and the Skull Base

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We describe a case of human lagochilascariasis, with skull-base involvement and a chronic and relapsing course after treatment. This rare parasitic infection is usually manifested in the head and neck area, characterized by progressive granulomatous inflammation and the formation of abscesses. Transmission to humans most likely occurs by the consumption of undercooked meat of wild rodents. On the basis of literature studies, we propose the most likely life cycle of the parasite that involves wild feline and rodent species, with humans as accidental hosts. Even in endemic areas, it is very difficult to recognize the disease at an early stage. Progression will eventually lead to involvement of the (central) nervous system, as described in our case. Treatment is often difficult and involves resection and prolonged treatment with anthelmintic drugs. Recurrences are not uncommon and at present, long-term oral administration of ivermectin seems to be the most effective treatment.

2. Am J TMH 2016 Jul 25. pii: 16-0295

Changes in Health-Seeking Behavior Did Not Result in Increased All-Cause Mortality During the Ebola Outbreak in Western Area, Sierra Leone

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Little is known about the residual effects of the west African Ebola virus disease (Ebola) epidemic on non-Ebola mortality and health-seeking behavior in Sierra Leone. We conducted a retrospective household survey to estimate mortality and describe health-seeking behavior in Western Area, Sierra Leone, between May 25, 2014, and February 16, 2015. We used two-stage cluster sampling, selected 30 geographical sectors with probability proportional to population size, and sampled 30 households per sector. Survey teams conducted face-to-face interviews and collected information on mortality and health-seeking behavior. We calculated all-cause and Ebola-specific mortality rates and compared health-seeking behavior before and during the Ebola epidemic using χ^2 and Fisher's exact tests. Ninety-six deaths, 39 due to Ebola, were reported in 898 households. All-cause and Ebola-specific mortality rates were 0.52 (95% confidence interval [CI] = 0.29-0.76) and 0.19 (95% CI = 0.01-0.38) per 10,000 inhabitants per day, respectively. Of those households that reported a sick family member during the month before the survey, 86% (73/85) sought care at a health facility before the epidemic, compared with 58% (50/86) in February 2015 ($P = 0.013$). Reported self-medication increased from 4% (3/85) before the epidemic to 23% (20/86) during the epidemic ($P = 0.013$). Underutilization of health services and increased self-medication did not show a demonstrable effect on non-Ebola-related mortality. Nevertheless, the residual effects of outbreaks need to be taken into account for the future. Recovery efforts should focus on rebuilding both the formalized health system and the population's trust in it.

3. BMJ 2016;353:i2035, Analysis

What does it mean to put new hepatitis C drugs on a list of essential medicines?

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Expensive treatments for common conditions are unaffordable for most health system, even if they are cost effective. Julian Urrutia and colleagues examine how countries could respond to WHO making direct acting antivirals essential medicines.

New direct acting antiviral drugs to treat hepatitis C infection are highly effective. Sofosbuvir and velpatasvir have been shown to achieve 90-100% cure rates regardless of hepatitis C virus (HCV) genotype. They are also very expensive, commanding list prices that can exceed \$1000 (£700; €880) a day. Nevertheless, studies have shown that treating everyone infected with HCV in the United States is cost effective from a societal perspective. Moreover, manufacturers are already offering substantial discounts. Advocates are thus demanding that these drugs should be made available for everyone infected with HCV. The World Health Organization (WHO) recently added sofosbuvir, along with other highly expensive medicines, to its model list of essential medicines. However, HCV infection is so common that covering these drugs for all who might benefit is not a realistic option for most health systems, even if the price were \$1 per pill, which is the estimated minimum cost of production, rather than \$1000. So how should countries respond?

Inclusion on the list does not mean that every country should guarantee access to everyone who might benefit, regardless of cost. WHO defines essential medicines as “those that satisfy the priority healthcare needs of the population.” Yet the agency also notes that “essential medicines are intended to be available ... at a price that the individual and the community can afford,” adding that the list is not designed to be a global standard but a “guide for the development of national and institutional essential medicine lists”.

4. EID 2016 Jul;22(7):1185-92

A Literature Review of Zika Virus

Plourde AR, Bloch EM

Zika virus is a mosquito-borne flavivirus that is the focus of an ongoing pandemic and public health emergency. Previously limited to sporadic cases in Africa and Asia, the emergence of Zika virus in Brazil in 2015 heralded rapid spread throughout the Americas. Although most Zika virus infections are characterized by subclinical or mild influenza-like illness, severe manifestations have been described, including Guillain-Barre syndrome in adults and microcephaly in babies born to infected mothers. Neither an effective treatment nor a vaccine is available for Zika virus; therefore, the public health response primarily focuses on preventing infection, particularly in pregnant women. Despite growing knowledge about this virus, questions remain regarding the virus's vectors and reservoirs, pathogenesis, genetic diversity, and potential synergistic effects of co-infection with other circulating viruses. These questions highlight the need for research to optimize surveillance, patient management, and public health intervention in the current Zika virus epidemic.

5. Lancet 2016 Jul 6. pii: S0140-6736(16)30579-7

The global burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013

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Background: With recent improvements in vaccines and treatments against viral hepatitis, an improved understanding of the burden of viral hepatitis is needed to inform global intervention strategies. We used data from the Global Burden of Disease (GBD) Study to estimate morbidity and mortality for acute viral hepatitis, and for cirrhosis and liver cancer caused by viral hepatitis, by age, sex, and country from 1990 to 2013.

Methods: We estimated mortality using natural history models for acute hepatitis infections and GBD's cause-of-death ensemble model for cirrhosis and liver cancer. We used meta-regression to estimate total cirrhosis and total liver cancer prevalence, as well as the proportion of cirrhosis and liver

cancer attributable to each cause. We then estimated cause-specific prevalence as the product of the total prevalence and the proportion attributable to a specific cause. Disability-adjusted life-years (DALYs) were calculated as the sum of years of life lost (YLLs) and years lived with disability (YLDs). Findings: Between 1990 and 2013, global viral hepatitis deaths increased from 0.89 million (95% uncertainty interval [UI] 0.86-0.94) to 1.45 million (1.38-1.54); YLLs from 31.0 million (29.6-32.6) to 41.6 million (39.1-44.7); YLDs from 0.65 million (0.45-0.89) to 0.87 million (0.61-1.18); and DALYs from 31.7 million (30.2-33.3) to 42.5 million (39.9-45.6). In 2013, viral hepatitis was the seventh (95% UI seventh to eighth) leading cause of death worldwide, compared with tenth (tenth to 12th) in 1990.

Interpretation: Viral hepatitis is a leading cause of death and disability worldwide. Unlike most communicable diseases, the absolute burden and relative rank of viral hepatitis increased between 1990 and 2013. The enormous health loss attributable to viral hepatitis, and the availability of effective vaccines and treatments, suggests an important opportunity to improve public health.

6. NEJM 2016;374:1281-1287

The Neglected Dimension of Global Security — A Framework for Countering Infectious-Disease Crises

Sands P, M.P.A., et al.

Pandemics and epidemics have ravaged human societies throughout history. The plague, cholera, and smallpox killed tens of millions of people and destroyed civilizations. In the past 100 years, the “Spanish Flu” of 1918–1919 and HIV–AIDS caused the deaths of nearly 100 million people. Advances in medicine have transformed our defenses against the threat of infectious disease. Better hygiene, antibiotics, diagnostics, and vaccines have given us far more effective tools for preventing and responding to outbreaks. Yet the severe acute respiratory syndrome (SARS), the Middle East respiratory syndrome (MERS), and the recent West African Ebola outbreak show that we cannot be complacent. Infectious-disease outbreaks that turn into epidemics and potential pandemics can cause massive loss of life and huge economic disruption.

Indeed, Ebola demonstrated how ill-prepared we are for such infectious-disease crises. There were failures at almost every level. Identifying the outbreak in the community and raising alerts took too long. Local health systems were quickly overwhelmed. Response teams did not adequately engage communities and deepened distrust in health authorities. The international response was slow, cumbersome, and poorly coordinated. Rapid diagnostics, protective equipment, effective therapeutics, and a vaccine were lacking. Ultimately, the crisis was contained, thanks to the courage and commitment of medical staff and communities on the ground and a massive deployment of international resources. Yet the cost in human lives and economic and social disruption was far greater than it should have been.

In this context, the Commission on a Global Health Risk Framework for the Future was initiated in the spring of 2015. Eight sponsors came together to support the initiative. The U.S. National Academy of Medicine provided leadership and guidance. An International Oversight Group comprising 12 leaders in science, business, and government was established to set up and guide the Commission.

The Commission itself comprised 17 members from 12 countries on 5 continents and included clinicians, scientists, social researchers, policy experts, industry leaders, financiers, and community leaders (see the roster and the Commission’s full report in the [Supplementary Appendix](#), available with the full text of this article at NEJM.org). We were tasked with providing recommendations on creating an effective global architecture for recognizing and mitigating the threat of epidemic infectious diseases.

Four key features characterized our work: independence — the remit, membership, and processes of the Commission were designed to ensure independence from individual governments, international agencies, and other stakeholders; forward-looking focus — the goal was not to analyze what went wrong with Ebola, but to devise recommendations for the future, drawing lessons not just from Ebola, but from previous outbreaks, including SARS, MERS, and the H1N1 influenza and HIV–AIDS pandemics; comprehensiveness — the Commission was tasked with considering every aspect of an

effective framework for preparedness, detection, and response to infectious-disease threats, ranging from models of international governance to local skills and infrastructure requirements, and with assessing implications for scientific research and development and define the financing requirements; and timeliness — the Commission was asked to complete its work within 6 months to enable its recommendations to inform policy initiatives in 2016.

Overview of recommendations:

The Commission's report includes 26 recommendations for concrete actions to be taken within specific timeframes. They are designed to work together as a comprehensive, coherent framework to counter the threat of infectious-disease crises.

The recommendations fall into four categories. Three recommendations aim to ensure that the global community implements the proposed framework, commits the financial resources required, and monitors progress.

Ten recommendations are directed at reinforcing national public health capabilities and infrastructure, such as disease-surveillance systems and laboratory networks. These are designed to work as a package: clarifying what needs to be done, ensuring accountability and transparency through rigorous external assessment, and providing the incentives and financial resources required. They also stress the importance of community engagement in pandemic preparedness and response.

Ten recommendations aim to strengthen the WHO's leadership role in coordinating global preparedness and response, working with other UN agencies, regional organizations, and nonstate actors including CSOs and the private sector. These recommendations also cover mobilization of international financial resources for pandemic response.

And three recommendations are aimed at enhancing our scientific armory against infectious disease, including prioritization, mobilization, and deployment of significantly greater resources and harmonization of development and regulatory-approval processes.

These recommendations encompass substantial changes to organizational structure and roles, new and modified processes and mechanisms, and new financial arrangements. Taken together, they create a global framework that would protect the world far better against infectious-disease threats.

7. NEJM 2016;374:1552-1563

Review Article: Zika Virus

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In 1947, a study of yellow fever yielded the first isolation of a new virus, from the blood of a sentinel rhesus macaque that had been placed in the Zika Forest of Uganda. Zika virus remained in relative obscurity for nearly 70 years; then, within the span of just 1 year, Zika virus was introduced into Brazil from the Pacific Islands and spread rapidly throughout the Americas. It became the first major infectious disease linked to human birth defects to be discovered in more than half a century and created such global alarm that the World Health Organization (WHO) would declare a Public Health Emergency of International Concern. This review describes the current understanding of the epidemiology, transmission, clinical characteristics, and diagnosis of Zika virus infection, as well as the future outlook with regard to this disease.

8. TMIH 2016;21(7):870-8

Challenges of bacterial meningitis case management in low income settings: an experience from Ethiopia

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Objective: To investigate the current diagnostic and therapeutic strategies used in the care of patients with suspected bacterial meningitis at teaching hospitals in Ethiopia.

Methods: This was a hospital-based retrospective study conducted at four teaching hospitals in different regions of Ethiopia. Participants were patients aged 14 years and older treated for suspected bacterial meningitis. Presenting complaints, diagnostic strategies used and treatments given were obtained from clinical records.

Result: A total of 425 patients were included in the study; 52.7% were men and 83.8% were younger than 50 years. Fever, headache, neck stiffness and impaired consciousness were the most common clinical presentations; 55.5% underwent lumbar puncture. Overall, only 96 (22.6%) patients had cerebrospinal fluid abnormalities compatible with bacterial meningitis. A causative bacterium was identified in only 14 cases. Ceftriaxone was used as the empiric treatment of choice, either alone or in combination with other antibiotics; 17.6% of patients were also given vancomycin. Adjunctive dexamethasone was given to 50.4%.

Conclusion: Most patients treated as bacterial meningitis did not receive a proper diagnostic workup. The choice of antibiotic was not tailored to the specific clinical condition of the patient. Such an approach may result in poor treatment outcomes and lead to antibiotic resistance. Management of patients with suspected bacterial meningitis should be supported by analysis of cerebrospinal fluid, and treatment should be tailored to local evidence and current evidence-based recommendations.

Health systems

9. HPP 2016;31(6):767-776

Targeting the poorest in a performance-based financing programme in northern Cameroon

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Performance-Based Financing (PBF) is a promising approach to improve health system performance in developing countries, but there are concerns that it may inadequately address inequalities in access to care. Incentives for reaching the poor may prove beneficial, but evidence remains limited. We evaluated a system of targeting the poorest of society ('indigents') in a PBF programme in Cameroon, examining (under)coverage, leakage and perceived positive and negative effects. We conducted a documentation review, 59 key informant interviews and 33 focus group discussions with community members (poor and vulnerable people—registered as indigents and those not registered as such). We found that community health workers were able to identify very poor and vulnerable people with a minimal chance of leakage to non-poor people. Nevertheless, the targeting system only reached a tiny proportion ($\leq 1\%$) of the catchment population, and other poor and vulnerable people were missed. Low a priori set objectives and implementation problems—including a focus on easily identifiable groups (elderly, orphans), unclarity about pre-defined criteria, lack of transport for identification and insufficient motivation of community health workers—are likely to explain the low coverage. Registered indigents perceived improvements in access, quality and promptness of care, and improvements in economic status and less financial worries. However, lack of transport and insufficient knowledge about the targeting benefits, remained barriers for health care use. Negative effects of the system as experienced by indigents included negative reactions (e.g. jealousy) of community members. In conclusion, a system of targeting the poorest of society in PBF programmes may help reduce inequalities in health care use, but only when design and implementation problems leading to substantial under-coverage are addressed. Furthermore, remaining barriers to health care use (e.g. transport) and negative reactions of other community members towards indigents deserve attention.

10. Lancet 2016 Jun 24. pii: S0140-6736(16)00342-1

What is the private sector? Understanding private provision in the health systems of low-income and middle-income countries

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Private health care in low-income and middle-income countries is very extensive and very heterogeneous, ranging from itinerant medicine sellers, through millions of independent practitioners—both unlicensed and licensed—to corporate hospital chains and large private insurers. Policies for universal health coverage (UHC) must address this complex private sector. However, no agreed measures exist to assess the scale and scope of the private health sector in these countries, and policy makers tasked with managing and regulating mixed health systems struggle to identify the key features of their private sectors. In this report, we propose a set of metrics, drawn from existing data that can form a starting point for policy makers to identify the structure and dynamics of private provision in their particular mixed health systems; that is, to identify the consequences of specific structures, the drivers of change, and levers available to improve efficiency and outcomes. The central message is that private sectors cannot be understood except within their context of mixed health systems since private and public sectors interact. We develop an illustrative and partial country typology, using the metrics and other country information, to illustrate how the scale and operation of the public sector can shape the private sector's structure and behaviour, and vice versa.

Other articles in this Series:

- Lancet 2016 Jun 24

Managing the public-private mix to achieve universal health coverage

- Lancet 2016 Jun 24

Performance of private sector health care: implications for universal health coverage

- Lancet 2016 Jun 24

Prohibit, constrain, encourage, or purchase: how should we engage with the private health-care sector?

11. [Lancet 2016 Jun 18;387\(10037\):2521-35](#)

National spending on health by source for 184 countries between 2013 and 2040

Dieleman JL et al., Institute for Health Metrics and Evaluation, Seattle, WA, USA; dieleman@uw.edu

Background: A general consensus exists that as a country develops economically, health spending per capita rises and the share of that spending that is prepaid through government or private mechanisms also rises. However, the speed and magnitude of these changes vary substantially across countries, even at similar levels of development. In this study, we use past trends and relationships to estimate future health spending, disaggregated by the source of those funds, to identify the financing trajectories that are likely to occur if current policies and trajectories evolve as expected.

Methods: We extracted data from WHO's Health Spending Observatory and the Institute for Health Metrics and Evaluation's Financing Global Health 2015 report. We converted these data to a common purchasing power-adjusted and inflation-adjusted currency. We used a series of ensemble models and observed empirical norms to estimate future government out-of-pocket private prepaid health spending and development assistance for health. We aggregated each country's estimates to generate total health spending from 2013 to 2040 for 184 countries. We compared these estimates with each other and internationally recognised benchmarks.

Findings: Global spending on health is expected to increase from US\$7·83 trillion in 2013 to \$18·28 (uncertainty interval 14·42–22·24) trillion in 2040 (in 2010 purchasing power parity-adjusted dollars). We expect per-capita health spending to increase annually by 2·7% (1·9–3·4) in high-income countries, 3·4% (2·4–4·2) in upper-middle-income countries, 3·0% (2·3–3·6) in lower-middle-income countries, and 2·4% (1·6–3·1) in low-income countries. Given the gaps in current health spending, these rates provide no evidence of increasing parity in health spending. In 1995 and 2015, low-income countries spent \$0·03 for every dollar spent in high-income countries, even after adjusting for

purchasing power, and the same is projected for 2040. Most importantly, health spending in many low-income countries is expected to remain low. Estimates suggest that, by 2040, only one (3%) of 34 low-income countries and 36 (37%) of 98 middle-income countries will reach the Chatham House goal of 5% of gross domestic product consisting of government health spending.

Interpretation: Despite remarkable health gains, past health financing trends and relationships suggest that many low-income and lower-middle-income countries will not meet internationally set health spending targets and that spending gaps between low-income and high-income countries are unlikely to narrow unless substantive policy interventions occur. Although gains in health system efficiency can be used to make progress, current trends suggest that meaningful increases in health system resources will require concerted action.

12. *Lancet* 2016 Jun 18;387(10037):2536-44

Development assistance for health: past trends, associations, and the future of international financial flows for health

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Background: Disbursements of development assistance for health (DAH) have risen substantially during the past several decades. More recently, the international community's attention has turned to other international challenges, introducing uncertainty about the future of disbursements for DAH.

Methods: We collected audited budget statements, annual reports, and project-level records from the main international agencies that disbursed DAH from 1990 to the end of 2015. We standardised and combined records to provide a comprehensive set of annual disbursements. We tracked each dollar of DAH back to the source and forward to the recipient. We removed transfers between agencies to avoid double-counting and adjusted for inflation. We classified assistance into nine primary health focus areas: HIV/AIDS, tuberculosis, malaria, maternal health, newborn and child health, other infectious diseases, non-communicable diseases, Ebola, and sector-wide approaches and health system strengthening. For our statistical analysis, we grouped these health focus areas into two categories: MDG-related focus areas (HIV/AIDS, tuberculosis, malaria, child and newborn health, and maternal health) and non-MDG-related focus areas (other infectious diseases, non-communicable diseases, sector-wide approaches, and other). We used linear regression to test for structural shifts in disbursement patterns at the onset of the Millennium Development Goals (MDGs; ie, from 2000) and the global financial crisis (impact estimated to occur in 2010). We built on past trends and associations with an ensemble model to estimate DAH through the end of 2040.

Findings: In 2015, US\$36.4 billion of DAH was disbursed, marking the fifth consecutive year of little change in the amount of resources provided by global health development partners. Between 2000 and 2009, DAH increased at 11.3% per year, whereas between 2010 and 2015, annual growth was just 1.2%. In 2015, 29.7% of DAH was for HIV/AIDS, 17.9% was for child and newborn health, and 9.8% was for maternal health. Linear regression identifies three distinct periods of growth in DAH. Between 2000 and 2009, MDG-related DAH increased by \$290.4 million (95% uncertainty interval [UI] 174.3 million to 406.5 million) per year. These increases were significantly greater than were increases in non-MDG DAH during the same period ($p=0.009$), and were also significantly greater than increases in the previous period ($p<0.0001$). Between 2000 and 2009, growth in DAH was highest for HIV/AIDS, malaria, and tuberculosis. Since 2010, DAH for maternal health and newborn and child health has continued to climb, although DAH for HIV/AIDS and most other health focus areas has remained flat or decreased. Our estimates of future DAH based on past trends and associations present a wide range of potential futures, although our mean estimate of \$64.1 billion (95% UI \$30.4 billion to \$161.8 billion) shows an increase between now and 2040, although with a large uncertainty interval.

Interpretation: Our results provide evidence of two substantial shifts in DAH growth during the past 26 years. DAH disbursements increased faster in the first decade of the 2000s than in the 1990s, but DAH associated with the MDGs increased the most out of all focus areas. Since 2010, limited growth has characterised DAH and we expect this pattern to persist. Despite the fact that DAH is still growing, albeit minimally, DAH is shifting among the major health focus areas, with relatively little

growth for HIV/AIDS, malaria, and tuberculosis. These changes in the growth and focus of DAH will have critical effects on health services in some low-income countries. Coordination and collaboration between donors and domestic governments is more important than ever because they have a great opportunity and responsibility to ensure robust health systems and service provision for those most in need.

HIV

13. HPP 2016;31(5):592-599

The uncertain future of lay counsellors: continuation of HIV services in Lesotho under pressure

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Between 2006 and 2011, when antiretroviral therapy (ART) was scaled up in a context of severe human resources shortages, transferring responsibility for elements in human immunodeficiency virus (HIV) care from conventional health workers to lay counsellors (LCs) contributed to increased uptake of HIV services in Lesotho. HIV tests rose from 79 394 in 2006 to 274 240 in 2011 and, in that same period, the number of people on ART increased from 17 352 to 83 624. However, since 2012, the jobs of LCs have been at risk because of financial and organizational challenges. We studied the role of LCs in HIV care in Lesotho between 2006 and 2013, and discuss potential consequences of losing this cadre.

Methods included a case study of LCs in Lesotho based on: (1) review of LC-related health policy and planning documents, (2) HIV programme review and (3) workload analysis of LCs. LCs are trained to provide HIV testing and counselling (HTC) and ART adherence support. Funded by international donors, 487 LCs were deployed between 2006 and 2011. However, in 2012, the number of LCs decreased to 165 due to a decreasing donor funds, while administrative and fiscal barriers hampered absorption of LCs into the public health system. That same year, ART coverage decreased from 61% to 51% and facility-based HTC decreased by 15%, from 253 994 in 2011 to 215 042 tests in 2012. The workload analysis indicated that LCs work averagely 77 h per month, bringing considerable relief to the scarce professional health workforce. HIV statistics in Lesotho worsened dramatically in the recent era of reduced support to LCs. This suggests that in order to ensure access to HIV care in an under-resourced setting like Lesotho, a recognized and well-supported counsellor cadre is essential. The continued presence of LCs requires improved prioritization, with national and international support.

14. Lancet 2016 Jul 14. pii: S0140-6736(16)30578-5

HIV and tuberculosis in prisons in sub-Saharan Africa

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Given the dual epidemics of HIV and tuberculosis in sub-Saharan Africa and evidence suggesting a disproportionate burden of these diseases among detainees in the region, we aimed to investigate the epidemiology of HIV and tuberculosis in prison populations, describe services available and challenges to service delivery, and identify priority areas for programmatically relevant research in sub-Saharan African prisons. To this end, we reviewed literature on HIV and tuberculosis in sub-Saharan African prisons published between 2011 and 2015, and identified data from only 24 of the 49 countries in the region. Where data were available, they were frequently of poor quality and rarely nationally representative. Prevalence of HIV infection ranged from 2.3% to 34.9%, and of tuberculosis from 0.4 to 16.3%; detainees nearly always had a higher prevalence of both diseases than did the non-incarcerated population in the same country. We identified barriers to prevention, treatment, and care services in published work and through five case studies of prison health policies

and services in Zambia, South Africa, Malawi, Nigeria, and Benin. These barriers included severe financial and human-resource limitations and fragmented referral systems that prevent continuity of care when detainees cycle into and out of prison, or move between prisons. These challenges are set against the backdrop of weak health and criminal-justice systems, high rates of pre-trial detention, and overcrowding. A few examples of promising practices exist, including routine voluntary testing for HIV and screening for tuberculosis upon entry to South African and the largest Zambian prisons, reforms to pre-trial detention in South Africa, integration of mental health services into a health package in selected Malawian prisons, and task sharing to include detainees in care provision through peer-educator programmes in Rwanda, Zimbabwe, Zambia, and South Africa. However, substantial additional investments are required throughout sub-Saharan Africa to develop country-level policy guidance, build human-resource capacity, and strengthen prison health systems to ensure universal access to HIV and tuberculosis prevention, treatment, and care of a standard that meets international goals and human rights obligations.

15. *TMIH* 2016;21(7):856-69

Which adherence measure - self-report, clinician recorded or pharmacy refill - is best able to predict detectable viral load in a public ART programme without routine plasma viral load monitoring?

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Objective: Combination antiretroviral therapy (cART) suppresses viral replication to an undetectable level if a sufficiently high level of adherence is achieved. We investigated which adherence measurement best distinguishes between patients with and without detectable viral load in a public ART programme without routine plasma viral load monitoring.

Method: We randomly selected 870 patients who started cART between May 2009 and April 2012 in 10 healthcare facilities in Addis Ababa, Ethiopia. Six hundred and sixty-four (76.3%) patients who were retained in HIV care and were receiving cART for at least 6 months were included and 642 had their plasma HIV-1 RNA concentration measured. Patients' adherence to cART was assessed according to self-report, clinician recorded and pharmacy refill measures. Multivariate logistic regression model was fitted to identify the predictors of detectable viremia. Model accuracy was evaluated by computing the area under the receiver operating characteristic (ROC) curve.

Result: A total of 9.2% and 5.5% of the 642 patients had a detectable viral load of ≥ 40 and ≥ 400 RNA copies/ml, respectively. In the multivariate analyses, younger age, lower CD4 cell count at cART initiation, being illiterate and widowed, and each of the adherence measures were significantly and independently predictive of having ≥ 400 RNA copies/ml. The ROC curve showed that these variables altogether had a likelihood of more than 80% to distinguish patients with a plasma viral load of ≥ 400 RNA copies/ml from those without.

Conclusion: Adherence to cART was remarkably high. Self-report, clinician recorded and pharmacy refill non-adherence were all significantly predictive of detectable viremia. The choice for one of these methods to detect non-adherence and predict a detectable viral load can therefore be based on what is most practical in a particular setting.

Malaria

16. *Am J TMH* 2016 Jul 11. pii: 16-0141

Global Epidemiology of Plasmodium vivax

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Plasmodium vivax is the most widespread human malaria, putting 2.5 billion people at risk of infection. Its unique biological and epidemiological characteristics pose challenges to control strategies that have been principally targeted against *Plasmodium falciparum*. Unlike *P. falciparum*, *P. vivax* infections have typically low blood-stage parasitemia with gametocytes emerging before illness manifests, and dormant liver stages causing relapses. These traits affect both its geographic distribution and transmission patterns. Asymptomatic infections, high-risk groups, and resulting case burdens are described in this review. Despite relatively low prevalence measurements and parasitemia levels, along with high proportions of asymptomatic cases, this parasite is not benign. *Plasmodium vivax* can be associated with severe and even fatal illness. Spreading resistance to chloroquine against the acute attack, and the operational inadequacy of primaquine against the multiple attacks of relapse, exacerbates the risk of poor outcomes among the tens of millions suffering from infection each year. Without strategies accounting for these *P. vivax*-specific characteristics, progress toward elimination of endemic malaria transmission will be substantially impeded.

17. *Lancet* 2016;387(10029):1775-84

The path to eradication: a progress report on the malaria-eliminating countries

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In the past several years, as worldwide morbidity and mortality due to malaria have continued to decrease, the global malaria community has grown increasingly supportive of the idea of malaria eradication. In 2015, three noteworthy global documents were released—the WHO's Global Technical Strategy for Malaria 2016-2030, the Roll Back Malaria Partnership's Action and Investment to Defeat Malaria 2016-2030, and From Aspiration to Action: What Will It Take to End Malaria?—that collectively advocate for malaria elimination and eradication and outline key operational, technical, and financial strategies to achieve progress toward malaria eradication. In light of this remarkable change in global attitudes toward malaria elimination and eradication, and as the malaria community debates how and when to embark on this ambitious goal, it is important to assess current progress along the path to eradication. Although low-income, high-burden countries are often the focus when discussing the substantial challenges of eradication, the progress toward elimination in middle-income, low-burden countries is a major driver of global progress and deserves better recognition. Additionally, although global support and guidance is essential for success, malaria elimination and eradication efforts will ultimately be driven at the country level and achieved in a collaborative manner, region by region. In this Review, we examine the present status of the 35 malaria-eliminating countries, summarise existing national and regional elimination goals and the regional frameworks that support them, and identify the most crucial enabling factors and potential barriers to achieving eradication by a theoretical end date of 2040.

18. *Lancet* 2016;387(10029):1785-8

Averting a malaria disaster: will insecticide resistance derail malaria control?

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World Malaria Day 2015 highlighted the progress made in the development of new methods of prevention (vaccines and insecticides) and treatment (single dose drugs) of the disease. However, increasing drug and insecticide resistance threatens the successes made with existing methods. Insecticide resistance has decreased the efficacy of the most commonly used insecticide class of pyrethroids. This decreased efficacy has increased mosquito survival, which is a prelude to rising

incidence of malaria and fatalities. Despite intensive research efforts, new insecticides will not reach the market for at least 5 years. Elimination of malaria is not possible without effective mosquito control. Therefore, to combat the threat of resistance, key stakeholders need to rapidly embrace a multifaceted approach including a reduction in the cost of bringing new resistance management methods to market and the streamlining of associated development, policy, and implementation pathways to counter this looming public health catastrophe.

Mental Health

19. HPP 2016;31(4):504-513

Scaling-up essential neuropsychiatric services in Ethiopia: a cost-effectiveness analysis

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Introduction: There is an immense need for scaling-up neuropsychiatric care in low-income countries. Contextualized cost-effectiveness analyses (CEAs) provide relevant information for local policies. The aim of this study is to perform a contextualized CEA of neuropsychiatric interventions in Ethiopia and to illustrate expected population health and budget impacts across neuropsychiatric disorders.

Methods: A mathematical population model (PopMod) was used to estimate intervention costs and effectiveness. Existing variables from a previous WHO-CHOICE regional CEA model were substantially revised. Treatments for depression, schizophrenia, bipolar disorder and epilepsy were analysed. The best available local data on epidemiology, intervention efficacy, current and target coverage, resource prices and salaries were used. Data were obtained from expert opinion, local hospital information systems, the Ministry of Health and literature reviews.

Results: Treatment of epilepsy with a first generation antiepileptic drug is the most cost-effective treatment (US\$ 321 per DALY averted). Treatments for depression have mid-range values compared with other interventions (US\$ 457–1026 per DALY averted). Treatments for schizophrenia and bipolar disorders are least cost-effective (US\$ 1168–3739 per DALY averted).

Conclusion: This analysis gives the Ethiopian government a comprehensive overview of the expected costs, effectiveness and cost-effectiveness of introducing basic neuropsychiatric interventions.

Mother and Child health/Sexual Reproductive Health

20. Am J TMH 2016 Aug 3;95(2):298-306

Availability and Quality of Emergency Obstetric and Newborn Care in Bangladesh
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Bangladesh's maternal mortality and neonatal mortality remain unacceptably high. We assessed the availability and quality of emergency obstetric care (EmOC) and emergency newborn care (EmNC) services at health facilities in Bangladesh. We randomly sampled 50 rural villages and 50 urban neighborhoods throughout Bangladesh and interviewed the director of eight and nine health facilities nearest to each sampled area. We categorized health facilities into different quality levels (high, moderate, low, and substandard) based on staffing, availability of a phone or ambulance, and signal functions (six categories for EmOC and four categories for EmNC). We interviewed the directors of 875 health facilities. Approximately 28% of health facilities did not have a skilled birth attendant on call 24 hours per day. The least commonly performed EmOC signal function was administration of anticonvulsants (67%). The quality of EmOC services was high in 33% and moderate in 52% of the

health facilities. The least common EmNC signal function was kangaroo mother care (7%). The quality of EmNC was high in 2% and moderate in 33% of the health facilities. Approximately one-third of health facilities lack 24-hour availability of skilled birth attendants, increasing the risk of peripartum complications. Most health facilities offered moderate to high quality services for EmOC and low to substandard quality for EmNC.

21. HPP 2016; 31 (4):462-471

Effect of a policy to reduce user fees on the rate of skilled birth attendance across socioeconomic strata in Burkina Faso

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Background: In Sub-Saharan Africa, maternal and neonatal morbidity and mortality rates are associated with underutilization of skilled birth attendance (SBA). In 2007, Burkina Faso introduced a subsidy scheme for SBA fees. The objective of this study was to evaluate the effect of Burkina Faso's subsidy policy on SBA rate across socioeconomic status (SES) strata.

Methods: We used a quasi-experimental design. The data sources were two representative surveys ($n = 1408$ and $n = 1403$) of women from Houndé and Ziniaré health districts of Burkina Faso, and a survey of health centres assessing structural quality of care. Multilevel Poisson regression models were used with robust variance estimators. We estimated adjusted rate ratios (RR) and rate differences (RD) as a function of time and SES.

Results: For lowest-SES women, immediately upon the introduction of the subsidy policy, the rate of SBA was 45% higher (RR = 1.45, 95% confidence interval (CI): 1.19–1.77) than expected in the absence of subsidy introduction. The results indicated a sustained effect after introduction of the subsidy policy, based on RR estimate (95% CI) of 1.48 (1.21–1.81) at 2 years. For middle-SES women, the RR estimates were 1.28 (1.09–1.49) immediately after introduction of the subsidy policy and 1.30 (1.11–1.51) at 2 years, respectively. For highest-SES women, the RR estimates were 1.19 (1.02–1.38) immediately after subsidy introduction and 1.21 (1.06–1.38) at 2 years, respectively. The RD (95% CI) was 14% (3–24%) for lowest-SES women immediately after introduction of the policy, and the effect was sustained at 14% (4–25%) at 2 years.

Conclusion: Our study suggests that the introduction of a user-fee subsidy in Burkina Faso resulted in increased rates of SBA across all SES strata. The increase was sustained over time and strongest among the poorest women. These findings have important implications for evidence-informed policymaking in Burkina Faso and other countries in Sub-Saharan Africa.

22. HPP 2016; 31 (5):656-666

Access to integrated community case management of childhood illnesses services in rural Ethiopia: a qualitative study of the perspectives and experiences of caregivers

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Background: In 2010, Ethiopia began scaling up the integrated community case management (iCCM) of childhood illness strategy throughout the country allowing health extension workers (HEWs) to treat children in rural health posts. After 2 years of iCCM scale up, utilization of HEWs remains low. Little is known about factors related to the use of health services in this setting. This research aimed to elicit perceptions and experiences of caregivers to better understand reasons for low utilization of iCCM services.

Methods: A rapid ethnographic assessment was conducted in eight rural health post catchment areas in two zones: Jimma and West Hararghe. In total, 16 focus group discussions and 78 in-depth interviews were completed with mothers, fathers, HEWs and community health volunteers.

Results: In spite of the HEW being a core component of iCCM, we found that the lack of availability of HEWs at the health post was one of the most common barriers to the utilization of iCCM services mentioned by caregivers. Financial and geographic challenges continue to influence caregiver decisions despite extension of free child health services in communities. Acceptability of HEWs was often low due to a perceived lack of sensitivity of HEWs and concerns about medicines given at the health post. Social networks acted both to facilitate and hinder use of HEWs. Many mothers stated a preference for using the health post, but some were unable to do so due to objections or alternative care-seeking preferences of gatekeepers, often mothers-in-law and husbands.

Conclusion: Caregivers in Ethiopia face many challenges in using HEWs at the health post, potentially resulting in low demand for iCCM services. Efforts to minimize barriers to care seeking and to improve demand should be incorporated into the iCCM strategy in order to achieve reductions in child mortality and promote equity in access and child health outcomes.

23. IJE 2016 Mar 4. pii: dyv367

Rapid acquisition of HPV around the time of sexual debut in adolescent girls in Tanzania

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Background: No reports exist on genotype-specific human papillomavirus (HPV) acquisition in girls after first sex in sub-Saharan Africa, despite high HPV prevalence and cervical cancer incidence.

Methods: We followed 503 HPV-unvaccinated girls aged 15-16 years in Mwanza, Tanzania, 3-monthly for 18 months with interviews and self-administered vaginal swabs. Swabs were tested for 13 high-risk and 24 low-risk HPV genotypes. Incidence, clearance and duration of overall HPV and genotype-specific infections were calculated and associated factors evaluated.

Results: A total of 106 participants reported first sex prior to enrolment (N = 29) or during follow-up (N = 77). One was HIV-positive at the final visit. The remaining 105 girls contributed 323 adequate specimens. Incidence of any new HPV genotype was 225/100 person-years (pys), and incidence of vaccine types HPV-6, -11, -16 and -18 were 12, 2, 2 and 7/100 pys, respectively. Reporting sex in the past 3 months and knowing the most recent sexual partner for a longer period before sex were associated with HPV acquisition. Median time from reported sexual debut to first HPV infection was 5 months, and infection duration was 6 months.

Conclusion: This is the first description of HPV acquisition after first sex in sub-Saharan Africa where the incidence of cervical cancer is amongst the highest in the world. HPV incidence was very high after first sex, including some vaccine genotypes, and infection duration was short. This very high HPV incidence may help explain high cervical cancer rates, and supports recommendations that the HPV vaccine should be given to girls before first sex.

24. Lancet 2016;388(10039):98–100

Viewpoint: Virginity testing in professional obstetric and gynaecological ethics

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The authors provide an ethical framework for the assessment of the doctor's role in virginity testing and its implications on how obstetrician-gynaecologists and other doctors should respond to such requests in clinical practice. This ethical framework is based on the professional responsibility model of ethics in obstetrics and gynaecology and its three core ethical principles of beneficence, respect for autonomy, and justice. The authors show that virginity testing is ethically unacceptable, because it violates beneficence-based, autonomy-based, and justice-based obligations to female patients. The authors conclude that doctors should refuse to conduct physical examinations for the purposes of virginity testing because virginity testing is incompatible with professional obstetric and gynaecological ethics.

Conclusion: Obstetrician-gynaecologists and other doctors have the professional responsibility to protect and promote the health-related interests of their female patients. Therefore, doctors have beneficence-based, autonomy-based, and justice-based obligations to protect and promote the biopsychosocial health of women and their human rights. Virginity testing is completely incompatible with such professional responsibility. Professional associations committed to the care of female patients have the professional responsibility to lead efforts to enact legislation that prohibits virginity testing.

25. PLoS Med 2016;13(6):e1002034

Early Childhood Developmental Status in Low- and Middle-Income Countries: National, Regional, and Global Prevalence Estimates Using Predictive Modeling

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Background: The development of cognitive and socioemotional skills early in life influences later health and well-being. Existing estimates of unmet developmental potential in low- and middle-income countries (LMICs) are based on either measures of physical growth or proxy measures such as poverty. In this paper we aim to directly estimate the number of children in LMICs who would be reported by their caregivers to show low cognitive and/or socioemotional development.

Methods and Findings: The present paper uses Early Childhood Development Index (ECDI) data collected between 2005 and 2015 from 99,222 3- and 4-y-old children living in 35 LMICs as part of the Multiple Indicator Cluster Survey (MICS) and Demographic and Health Surveys (DHS) programs. First, we estimate the prevalence of low cognitive and/or socioemotional ECDI scores within our MICS/DHS sample. Next, we test a series of ordinary least squares regression models predicting low ECDI scores across our MICS/DHS sample countries based on country-level data from the Human Development Index (HDI) and the Nutrition Impact Model Study. We use cross-validation to select the model with the best predictive validity. We then apply this model to all LMICs to generate country-level estimates of the prevalence of low ECDI scores globally, as well as confidence intervals around these estimates. In the pooled MICS and DHS sample, 14.6% of children had low ECDI scores in the cognitive domain, 26.2% had low socioemotional scores, and 36.8% performed poorly in either or both domains. Country-level prevalence of low cognitive and/or socioemotional scores on the ECDI was best represented by a model using the HDI as a predictor. Applying this model to all LMICs, we estimate that 80.8 million children ages 3 and 4 y (95% CI 48.1 million, 113.6 million) in LMICs experienced low cognitive and/or socioemotional development in 2010, with the largest number of affected children in sub-Saharan Africa (29.4.1 million; 43.8% of children ages 3 and 4 y), followed by South Asia (27.7 million; 37.7%) and the East Asia and Pacific region (15.1 million; 25.9%). Positive associations were found between low development scores and stunting, poverty, male sex, rural residence, and lack of cognitive stimulation. Additional research using more detailed developmental assessments across a larger number of LMICs is needed to address the limitations of the present study.

Conclusions: The number of children globally failing to reach their developmental potential remains large. Additional research is needed to identify the specific causes of poor developmental outcomes in diverse settings, as well as potential context-specific interventions that might promote children's early cognitive and socioemotional well-being.

26. TMIH 2016;21(8):943-955

Aetiologies of non-malaria febrile episodes in children under 5 years in sub-Saharan Africa

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Objectives: To provide an overview of the most frequent aetiologies found in febrile episodes of children under 5 years from sub-Saharan Africa.

Methods: MEDLINE and EMBASE were searched for publications in English and French on non-malaria fever episodes in African children under 5 years of age, which were published between January 1990 and July 2015. Case reports and conference abstracts were excluded.

Results: In total, 3851 titles and abstracts were reviewed, and 153 were selected for full screening of which 18 were included in the present review. Bloodstream infection (BSI) was most commonly investigated (nine of 18) followed by urinary tract infection (UTI) (four of 18) and respiratory tract infection (RTI) (two of 18). Few studies investigated BSI and UTI in the same children (two of 18), or BSI and gastrointestinal infection (GII) (one of 18). As for BSI, the most frequently isolated bacteria were *E. coli* (four of 12), *Streptococcus pneumoniae* (four of 12), *Salmonella* spp (three of 12) and *Staphylococcus aureus* (two of 12) with a positive identification rate of 19.7-33.3%, 5.2-27.6%, 11.7-65.4% and 23.5-42.0%, respectively. As for UTI, the main bacteria isolated were *E. coli* (six of six) and *Klebsiella* spp (six of six) with a positive rate of 20.0-72.3% and 10.0-28.5%, respectively. No bacterium was isolated in RTI group, but Human influenzae A and B were frequently found, with the highest positive identification rate in Tanzania (75.3%). Dengue virus (two of 12) was the most frequently reported viral infection with a positive identification rate of 16.7-30.8%. Finally, only rotavirus/adenovirus (69.2% positive identification rate) was found in GII and no bacterium was isolated in this group.

Conclusions: The high prevalence of treatable causes of non-malaria fever episodes requires a proper diagnosis of the origin of fever followed by an appropriate treatment, thereby reducing the under-5 mortality in sub-Saharan Africa and preventing the overprescription of antibiotics and thus circumventing the rise of antibiotic resistance.

27. *TMIH* 2016;21(7):879-85

Maternal obesity and Caesarean delivery in sub-Saharan Africa

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Objectives: To quantify maternal obesity as a risk factor for Caesarean delivery in sub-Saharan Africa.

Methods: Multivariable logistic regression analysis using 31 nationally representative cross-sectional data sets from the Demographic and Health Surveys (DHS).

Results: Maternal obesity was a risk factor for Caesarean delivery in sub-Saharan Africa; a clear dose-response relationship (where the magnitude of the association increased with increasing BMI) was observable. Compared to women of optimal weight, overweight women (BMI 25-29 kg/m²) were significantly more likely to deliver by Caesarean (OR: 1.54; 95% CI: 1.33, 1.78), as were obese women (30-34.9 kg/m²) (OR: 2.39; 95% CI: 1.96-2.90); 35-39.9 kg/m²) (OR: 2.47 95% CI: 1.78-3.43) and morbidly obese women (BMI ≥40 kg/m²) OR: 3.85; 95% CI: 2.46-6.00).

Conclusions: BMI is projected to rise substantially in sub-Saharan Africa over the next few decades and demand for Caesarean sections already exceeds available capacity. Overweight women should be advised to lose weight prior to pregnancy. Furthermore, culturally appropriate prevention strategies to discourage further population-level rises in BMI need to be designed and implemented.

Non Communicable Diseases

28. Bull WHO 2016;94(7):501-9

Outcomes and costs of implementing a community-based intervention for hypertension in an urban slum in Kenya

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Objective: To describe the processes, outcomes and costs of implementing a multi-component, community-based intervention for hypertension among adults aged > 35 years in a large slum in Nairobi, Kenya.

Methods: The intervention in 2012-2013 was based on four components: awareness-raising; improved access to screening; standardized clinical management of hypertension; and long-term retention in care. Using multiple sources of data, including administrative records and surveys, we described the inputs and outputs of each intervention activity and estimated the outcomes of each component and the impact of the intervention. We also estimated the costs associated with implementation, using a top-down costing approach.

Findings: The intervention reached 60% of the target population (4049/6780 people), at a cost of 17 United States dollars (US\$) per person screened and provided access to treatment for 68% (660/976) of people referred, at a cost of US\$ 123 per person with hypertension who attended the clinic. Of the 660 people who attended the clinic, 27% (178) were retained in care, at a cost of US\$ 194 per person retained; and of those patients, 33% (58/178) achieved blood pressure control. The total intervention cost per patient with blood pressure controlled was US\$ 3205.

Conclusion: With moderate implementation costs, it was possible to achieve hypertension awareness and treatment levels comparable to those in high-income settings. However, retention in care and blood pressure control were challenges in this slum setting. For patients, the costs and lack of time or forgetfulness were barriers to retention in care.

29. Lancet 2016;387(10033):2133-44

Costs, affordability, and feasibility of an essential package of cancer control interventions in low-income and middle-income countries: key messages from Disease Control Priorities, 3rd edition

Gelband H, Disease Control Priorities-3 Cancer Author Group et al.

Investments in cancer control--prevention, detection, diagnosis, surgery, other treatment, and palliative care--are increasingly needed in low-income and particularly in middle-income countries, where most of the world's cancer deaths occur without treatment or palliation. To help countries expand locally appropriate services, Cancer (the third volume of nine in Disease Control Priorities, 3rd edition) developed an essential package of potentially cost-effective measures for countries to consider and adapt. Interventions included in the package are: prevention of tobacco-related cancer and virus-related liver and cervical cancers; diagnosis and treatment of early breast cancer, cervical cancer, and selected childhood cancers; and widespread availability of palliative care, including opioids. These interventions would cost an additional US\$20 billion per year worldwide, constituting 3% of total public spending on health in low-income and middle-income countries. With implementation of an appropriately tailored package, most countries could substantially reduce suffering and premature death from cancer before 2030, with even greater improvements in later decades.

30. TMIH 2016;21(8):1019-1028

Cost of hospitalisation for non-communicable diseases in India: are we pro-poor?

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Objectives: To estimate out-of-pocket (OOP) expenditure due to hospitalisation from NCDs and its impact on households in India.

Methods: The study analysed nationwide representative data collected by the National Sample Survey Organisation in 2014 that reported health service utilisation and healthcare-related OOP expenditure by income quintiles and by type of health facility (public or private). The recall period for inpatient hospitalisation expenditure was 365 days. Consumption expenditure was collected for a recall period of 1 month. OOP expenditure amounting to >10% of annual consumption expenditure was termed as catastrophic. Weighted analysis was performed.

Results: The median expenditure per episode of hospitalisation due to NCDs was USD 149 - this was ~3 times higher among the richest quintile compared to poorest quintile. There was a significantly higher prevalence of catastrophic expenditure among the poorest quintile, more so for cancers (85%), psychiatric and neurological disorders (63%) and injuries (63%). Mean private-sector OOP hospitalisation expenditure was nearly five times higher than that in the public sector. Medicines accounted for 40% and 27% of public- and private-sector OOP hospitalisation expenditure, respectively.

Conclusion: Strengthening of public health facilities is required at community level for the prevention, control and management of NCDs. Promotion of generic medicines, better availability of essential drugs and possible subsidisation for the poorest quintile will be measures to consider to reduce OOP expenditure in public-sector facilities.

Tuberculosis

31. Bull WHO 2016;94(6):433-41

A tuberculosis nationwide prevalence survey in Gambia, 2012

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Objective: To estimate the population prevalence of active pulmonary tuberculosis in Gambia.

Methods: Between December 2011 and January 2013, people aged ≥ 15 years participating in a nationwide, multistage cluster survey were screened for active pulmonary tuberculosis with chest radiography and for tuberculosis symptoms. For diagnostic confirmation, sputum samples were collected from those whose screening were positive and subjected to fluorescence microscopy and liquid tuberculosis cultures. Multiple imputation and inverse probability weighting were used to estimate tuberculosis prevalence.

Findings: Of 100 678 people enumerated, 55 832 were eligible to participate and 43 100 (77.2%) of those participated. A majority of participants (42 942; 99.6%) were successfully screened for symptoms and by chest X-ray. Only 5948 (13.8%) were eligible for sputum examination, yielding 43 bacteriologically confirmed, 28 definite smear-positive and six probable smear-positive tuberculosis cases. Chest X-ray identified more tuberculosis cases (58/69) than did symptoms alone (43/71). The estimated prevalence of smear-positive and bacteriologically confirmed pulmonary tuberculosis were 90 (95% confidence interval, CI: 53-127) and 212 (95% CI: 152-272) per 100 000 population, respectively. Tuberculosis prevalence was higher in males (333; 95% CI: 233-433) and in the 35-54 year age group (355; 95% CI: 219-490).

Conclusion: The burden of tuberculosis remains high in Gambia but lower than earlier estimates of 490 per 100 000 population in 2010. Less than half of all cases would have been identified based on smear microscopy results alone. Successful control efforts will require interventions targeting men, increased access to radiography and more accurate, rapid diagnostic tests.

Other

32. Bull WHO 2016 Feb 1;94(2):111-121A

[Drinking water and sanitation: progress in 73 countries in relation to socioeconomic indicators](#)

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Objective: To assess progress in the provision of drinking water and sanitation in relation to national socioeconomic indicators.

Methods: We used household survey data for 73 countries - collected between 2000 and 2012 - to calculate linear rates of change in population access to improved drinking water (n = 67) and/or sanitation (n = 61). To enable comparison of progress between countries with different initial levels of access, the calculated rates of change were normalized to fall between -1 and 1. In regression analyses, we investigated associations between the normalized rates of change in population access and national socioeconomic indicators: gross national income per capita, government effectiveness, official development assistance, freshwater resources, education, poverty, Gini coefficient, child mortality and the human development index.

Findings: The normalized rates of change indicated that most of the investigated countries were making progress towards achieving universal access to improved drinking water and sanitation. However, only about a third showed a level of progress that was at least half the maximum achievable level. The normalized rates of change did not appear to be correlated with any of the national indicators that we investigated.

Conclusion: In many countries, the progress being made towards universal access to improved drinking water and sanitation is falling well short of the maximum achievable level. Progress does not appear to be correlated with a country's social and economic characteristics. The between-country variations observed in such progress may be linked to variations in government policies and in the institutional commitment and capacity needed to execute such policies effectively.

33. Lancet 2016;387(10037):2480

Editorial: Sickle-cell disease: managing comorbidities

To coincide with World Sickle Cell Day on June 19, The Lancet is publishing its first haematology Series commissioned to review three topical and clinically important aspects of sickle-cell disease. At least 90% of children and adults with sickle-cell anaemia live in sub-Saharan Africa and in south Asia, where the disease remains life threatening, particularly in childhood, and where the burden of the disease is expected to rise. For children living in high-income countries, mortality due to sickle-cell anaemia has been dramatically reduced to less than 2% by 15 years of age, but as children live longer, age-dependent end-organ dysfunction has assumed greater importance in clinical management.

Two of the Series papers examine respiratory and cardiac complications and comorbidities. Michael DeBaun and Robert Strunk review asthma and acute chest syndrome in children with sickle-cell anaemia. With their colleagues, DeBaun and Strunk were the first to document that asthma worsens outcomes in sickle-cell disease, as the Obituary of Strunk in this issue describes. Despite overlapping risk factors and symptoms, acute chest syndrome and asthma are two distinct entities that require specific management strategies.

Articles in this series:

- Lancet 2016;387(10037):2545-53

The intersection between asthma and acute chest syndrome in children with sickle-cell anaemia
Mark Gladwin reviews the chronic effect of sustained haemolytic anaemia and the episodic vaso-occlusive events that result in pulmonary hypertension, left ventricular diastolic heart disease,

dysrhythmia, and sudden death. Data are lacking on interventions that work, and Gladwin calls for more research in larger populations with the disease.

- Lancet 2016;387(10037):2565-74

Cardiovascular complications and risk of death in sickle-cell disease

Guillaume Lettre and Daniel Bauer review the evidence supporting the disease modifying role of fetal haemoglobin in reducing sickling, and how induction of fetal haemoglobin production has potential in treatment. As this Series paper emphasises, genome editing technology offers hope for new treatments based on fetal haemoglobin, but for most people with the disease in Africa and south Asia, an affordable solution such as hydroxyurea is more practical.

- Lancet 2016;387(10037):2554-64

Fetal haemoglobin in sickle-cell disease: from genetic epidemiology to new therapeutic strategies

The future promises therapeutic strategies and potential cures, but for most with sickle-cell disease, the theme of this year's World Sickle Cell Day “exhibit courage” is the harsh reality of the pain of sickle-cell crises and the disease's disabling long-term consequences.

34. NEJM 2016; 374:2511-2514

Perspective (abridged): Time for a Model List of Essential Diagnostics

Lee F. Schroeder, M.D., et al.

The Model List of Essential Medicines (EML) maintained by the World Health Organization (WHO) plays a central role in global health policy. We believe that it's time to establish a similarly influential Model List of Essential Diagnostics (EDL). According to the WHO, the items included in the EML are “drugs that satisfy the health care needs of the population [and] . . . are intended to be available at all times . . . at a price the individual and community can afford.” Inclusion in the EML is often necessary before large funders (ministries of health, nongovernmental organizations, and insurers) will invest in and orchestrate negotiated, large-scale procurement of a given medication.

Diagnostic tests are also required for fulfilling the health care needs of populations. They are critical to the management of communicable and noncommunicable diseases, surveillance of emerging infectious threats such as the Ebola and Zika viruses, and the safe and rational use of EML medicines, including stewardship of anti-infective agents to reduce the likelihood of the development of microbial resistance. Improved access to diagnostics has been shown to quadruple the number of cases of human immunodeficiency virus (HIV) infection detected, double the rate of adequate glycemic control, and reduce overtreatment of malaria by 73%. Thus, an EDL could, like the EML, help drive improved health care delivery.

The goal of an EDL would not be wholesale adoption by countries for use in all laboratories or for all patients. Rather, the list would represent tests that should be reasonably available for people who need them, whether in the form of point-of-care tests in physicians' offices and pharmacies or as high-complexity tests in reference laboratories. Furthermore, as with the EML, there could be individualized, country-specific lists tailored to local burdens of disease. Expert groups could be responsible for reviewing applications and periodically updating the diagnostics list to account for improvements in technology and shifting disease epidemiology.

The question of whether such a model list would be best maintained by the WHO merits further discussion. Since the WHO maintains the EML and is instrumental in developing medical guidelines as well as laboratory-accreditation schemes suitable for low-resource settings, it is an obvious choice. Wherever the list is housed, its existence would facilitate group purchasing to reduce costs and inspire development of logistical solutions for laboratory testing in resource-poor settings. We believe the world can no longer wait to have laboratory testing available to all clinicians. An EDL would clarify priorities for policymakers and encourage setting common goals regarding laboratory testing, paving the way toward improved health care delivery and ultimately better patient outcomes.

Review Article: Medical Considerations before International Travel

Dan L. Longo, M.D., Editor; David O. Freedman, et al.

In 2015, international tourist arrivals in all countries exceeded 1.2 billion persons. In 2014, the total number of arrivals in countries with emerging markets nearly surpassed the number in developed countries (www.e-unwto.org/doi/book/10.18111/9789284416899). Depending on the destination, 22 to 64% of travelers report some illness; most of these illnesses are mild and self-limited, such as diarrhea, respiratory infections, and skin disorders. Some travelers return to their own countries with preventable life-threatening infections. Yet 20 to 80% of travelers do not seek pretravel health consultation. Data about the effect of pretravel advice are limited, although such advice has had a positive effect on the prevention of malaria. Travelers visiting friends and relatives in their country of origin constitute the group with the highest morbidity, especially from malaria and typhoid; this group requires special approaches to illness prevention and education. Persons who are planning to travel to other countries often ask their health care providers for information about preventive interventions. Nonspecialists can provide information and care to healthy adults traveling to common destinations by following protocols such as those offered in this review. Advice from a specialist is of benefit for persons who are planning high-risk or adventure travel, those who are immunocompromised or have underlying chronic disease, those who are planning to live abroad for a long time, women who are pregnant or plan to become pregnant soon, young children, and travelers with complicated itineraries.

A body of knowledge in travel medicine has been published by the International Society of Travel Medicine (www.istm.org/bodyofknowledge). Available publications, especially those from GeoSentinel, which is the International Society of Travel Medicine– CDC database of travel-related illnesses, and online resources (Table S1 in the Supplementary Appendix) should be consulted frequently to stay up to date on constantly changing epidemiology. Preventive strategies and medical interventions need to be individualized. No traveler should leave the consultation without understanding the importance of seeking expert medical advice immediately if fever develops after the return home.