were greater for blood ($p < 0.0001$) and FFP ($p=0.0001$) for children with electrical and flame injuries compared to scald injuries.
Interpretation: Electrical and flame burns are a significant source of injury among children in Mexico, and these burns carry increased morbidity. Future prevention efforts should address these mechanisms, and assess specifically in what regions these burns are most evident and whether specific interventions could be targeted to these environments and populations.
Funding: No additional funding to report.
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Epidemiology and analysis of common behavioral patterns of motorbike accidents with head trauma at a government hospital in Phnom Penh (Cambodia)

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Background: Motorbike accidents are a major cause of head trauma in Cambodia, likely due to the increasing use of motorbikes, bad road conditions, non-regulated traffic laws, and a low rate of helmet use amongst motorbike drivers. The aim of this study was to investigate common causative factors and behavioral patterns of motorcyclists with head trauma.
Methods: In this cross-sectional study, we analyzed 180 motorbike-related head trauma cases admitted to the Department of Neurosurgery at Preah Kossamak Hospital in Phnom Penh, Cambodia from October 2013 to August 2014. Age, sex, time of injury, mechanism of injury, helmet usage, alcohol involvement, diagnosis, and Glasgow Outcome Scale (GOS) were collected and analyzed. Pearson's Chi-square-test of significance and frequency tables were used. The study was approved by the Institutional Review Board at the New York University, New York, New York.
Findings: The male to female ratio was 5:1. The age ranged from 16-60 with a predominant peak at 19-26 years. Most accidents occurred on Sunday (25%) followed by Monday (17%). A high percentage of accidents occurred at night (59%). The most common mechanism was collision with another motorbike (42%), followed by a fall from motorbike (25%). 45 % of patients admitted to alcohol intake. Significantly more male patients (51 %) then female patients (13 %) admitted to alcohol involvement at the time of accident ($p=0.0005$). Interestingly, there was no connection between alcohol involvement and helmet usage. Only 7% of the patients reported wearing a helmet, and males were twice as more likely than females to wear a helmet (8% vs. 4%). The most common diagnosis was concussion (37% of patients), followed by brain contusion (29%). Skull fracture (27%) was the most common fracture, followed closely by facial fracture (23%). Of the 62 patients who completed the follow-up questionnaire, 10 % reported a GOS under 4 (severe injury with permanent need for help). 3 patients died.
Interpretation: The scope of study is limited to head trauma patients admitted to a single neurosurgical department. Therefore our data does not reflect the actual helmet usage rate on the street. Nevertheless, the rate of helmet usage in our patient population is significantly less than the previously published street rates in Cambodia. Assuming that accident rates between helmeted and unhelmeted motorcycles drivers are equal, we can surmise that drivers wearing a helmet at the time of an accident are less likely to present to our department. The high percentage of alcohol use while driving and the low rate of helmet use calls for educational programs to raise awareness for road safety and change the behavior of the drivers. Furthermore, a stricter enforcement of helmet laws is recommended.
Funding: World Federation of Neurosurgical Societies and the Korean American Medical Association.
Abstract #: *02NCD010*

Report on the feasibility of implementing hemoglobin A1c in the WHO STEPwise approach to surveillance (STEPS)

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Background: Over 80% of diabetes deaths occur in low- and middle-income countries. To better track and respond to this growing problem, the World Health Organization STEPwise Approach (STEPS) collects risk factor data throughout the developing world on diabetes and other non-communicable diseases. Currently diabetes risk is measured by fasting blood glucose (FBG) levels. This indicator, while inexpensive, requires two visits for every participant, one in which they are instructed to fast for 12 hours and a second where the blood samples are obtained. In the context of rural, developing settings, this leads to a more time-intensive and therefore more costly data collection process. Hemoglobin A1c (HbA1c) was assessed as a potential alternative to FBG for measuring diabetes risk. HbA1c reflects time-averaged glucose levels over the preceding month and therefore does not require fasting or a preliminary visit. Implementation could save WHO resources and might also improve the quality of data; non-compliant fasting among sampled populations is thought to falsely elevate diabetes risk measured by FBG.
Methods: A literature search was conducted to determine the feasibility of HbA1c implementation in global surveillance. Specifically, two particular qualities were assessed: the validity of HbA1c in disparate global populations and the availability of suitably accurate battery-powered point-of-care analyzers. For the former, a search algorithm was used to unearth geographically heterogeneous factors that influence HbA1c levels (namely ethnicity and anemia). A mathematical model was then used to predict the degree to which this would skew global prevalence rankings for raised plasma glucose. For the latter, all literature assessing the quality of modern battery-powered HbA1c devices was collected. From this, precision and accuracy were assessed and compared to National Glycohemoglobin Standardization Program criteria.
Findings: Both the validity of HbA1c in the context of global surveillance and the availability of suitable devices proved insufficient. Of the many non-glycemic factors found to influence HbA1c, iron deficiency anemia (IDA) presents the greatest barrier to its application as a global indicator. In South Asia, IDA would elevate national average HbA1c values by 0.32 ± 0.07 A1c and generate false positives in 8.6 ± 2.0 % of the population. In terms of available devices, battery-powered A1c analyzers were found all to vary in bias by more than 0.3 A1c between two randomly selected manufacturing lots.
Interpretation: Both the impact of hematologic diseases like anemia and the lot-to-lot variability in modern devices could introduce unacceptable error into cross-country comparison of diabetes prevalence.

We therefore conclude that global surveillance of diabetes risk should not employ HbA1c, at least until the technology used to measure it and the knowledge concerning its non-glycemic influences has progressed.
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Developing a culturally-adapted intervention for depression and poor adherence to art in Zimbabwe: The Tendai study

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Background: Depression increases the risk of poor adherence to antiretroviral therapy in people living with HIV/AIDS. However, there has been little research on the lived experiences of HIV-positive people with co-morbid depression and suboptimal adherence to antiretroviral therapy in sub-Saharan Africa. We use data from this study to develop a combined intervention for depression and adherence in HIV-positive adults in Zimbabwe.
Methods: In-depth qualitative interviews were conducted with HIV-positive adults (n=47) who scored above the cut-point on a locally-validated scale for depression and who were identified via purposive sampling to have suboptimal adherence to antiretroviral therapy. Six (n=6) further key informant interviews were conducted with healthcare workers. Data were collected and analysed using rigorous grounded theory methods.
Findings: Local expressions of depression, such as "kufungisisa" (thinking too much) and "moyo unorwadza" (burdened heart) had a significant negative impact on adherence to ART (Table 1). Participants perceived their minds to be so full that they forgot to take medications or could not hear reminder alarms. Additional stressors such as poverty, stigma, and marital problems worsened the depressive cycle for participants and were further barriers to adherence.
Interpretation: This is the first study to identify thinking too much as a major barrier to antiretroviral therapy adherence among HIV-positive adults with depression. Better understanding of the local expression of mental disorders and of underlying stressors has informed the development of a new, culturally-appropriate intervention for adherence and depression that is currently being tested in a clinical trial.
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Implementation of low-cost, point-of-care cardiovascular diagnostics by non-healthcare professionals in rural Uganda

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Background: Non-communicable diseases (NCDs) account for the majority of adult deaths worldwide, and 80% of these deaths occur in low and middle-income countries (LMICs). The burden of NCDs in LMICs is predicted to grow with improvements in sanitation and infectious disease control, and will be altered by local diet, smoking rates, and HIV co-infection. There is a critical need to identify and implement low-cost, well-validated diagnostic tests to elucidate the epidemiology of NCDs, and enable diagnostic monitoring and therapeutic interventions. Moreover, tests that enable non-healthcare professionals to lead care provision will augment the scalability of this strategy. We recently completed implementation and evaluation of a bundle of point-of-care, low-cost diagnostics for NCD measurement in rural Uganda.
Methods: We performed a cross-sectional cohort study in rural, southwestern Uganda of HIV-infected persons on antiretroviral therapy at the Mbarara Regional Referral Hospital and a control group of HIV-uninfected persons from the clinic catchment area. Three non-healthcare professional Ugandan staff completed a two-week intensive course to perform a series of point-of-care cardiovascular assessments, including portable electrocardiogram (EKG), ankle-brachial index (ABI), hemoglobin A1c testing (HbA1c), automated blood pressure, and anthropometric measurements. An American medical student was trained through the University of Wisconsin Atherosclerosis Imaging Research Program to perform measurement of carotid intima-media thickness (CIMT). We assessed the quality and feasibility of each measurement by: 1) proportion of valid hemoglobin A1c results; 2) proportion of interpretable carotid ultrasound images as graded by a board-certified vascular cardiologist using the University of Wisconsin CIMT image quality assessment scale; and 3) correlation between brachial blood pressure measurements and automated systolic blood pressure measurements. The study received ethics approval from the Mbarara University of Science & Technology and Partners Healthcare. All participants provided written informed consent.
Findings: 105 HIV-infected and 90 HIV-uninfected individuals were enrolled in the study. None of the HbA1c tests were invalid (0/195). Of the 96 CIMT images reviewed, 86 (90%) were found to be of adequate quality, and 10 (10.4%) were not suitable for measurement. The right and left brachial blood pressure measurements had coefficients of determination of 0.79 and 0.72, respectively, with the automated systolic blood pressure measurements. Based on an estimate patient volume of 1,000 patients per year and measurement for 3 years, the cost for this array of tests, including capital equipment, would be approximately $28 per patient.
Interpretation: Low-cost, portable, and well-validated point-of-care tests can be implemented by non-medical professionals in LMICs. Implementation evaluations should be pursued to assess the large-scale feasibility, scalability, and impact of this strategy.
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Cognitive performance in Early Head Start interventions among infants 0-3 years: The impact of early childhood risk factors

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Background: Early child development is a critical component of many Millennium Development Goals. The home environment plays an impactful role in providing a supportive atmosphere for stimulation and learning opportunities. Maternal depression, a risk factor for responsive caregiving from the mother or primary caregiver, is also crucial for development. This study was done to build on the