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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Abstract #: *02NCD011*

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

evidence base of how these covariates influence child cognition and to illustrate the benefits of early education programs in low-resource settings. The aim of this study is to evaluate the association between the federally funded education program Early Head Start (EHS) and the cognitive abilities of children in low-income family enrollees and assess if this association varies by the quality of the home environment and the existence of maternal depression. We hypothesize that the EHS program has a positive direct effect on infant cognition, and that maternal depression and a diminished home environment will modify this association, leading to reduced scores in infant cognition.
Methods: A large-scale impact evaluation of the EHS program for low-income pregnant women and families with children up to 3 years of age, this prospective study followed a diverse racial/ethnic group of 3,001 children from 17 sites, both urban and rural, from 1996 to 2010. The analysis examines infants from enrollment to age 3. Eligible families were randomly assigned to control or program groups with equal probabilities, with requirements including having a focus child less than 12 months of age at enrollment. Control groups were unable to receive program services until focus child was at least 3 years old. Data was collected using self-enumerated questionnaires, personal interviews, and direct observation. Statistical analyses included independent t-tests, linear regression, and testing for confounding, mediation, and interaction. Cognitive performance, the primary outcome, was measured by the Bayley Scale (2nd Ed.)
Findings: Of 2977 total subjects, 1503 subjects were randomly assigned into the program group. Independent t-tests indicated that exposure to EHS services had a significant effect on cognitive performance at 24 months (p=.0155) and 36 months (p=.0698). Linear regression analyses indicated that home environment and program status had interaction effects (p=.0376) at 36 months but not 24 months. Maternal depression did not have interaction effects.
Interpretation: Results support the main hypothesis that cognitive performance follows a trend of being higher in children receiving EHS services. Home and environment and maternal depression had small or null effects on this association. This could be due to study design or inappropriate selection and use of assessment tools. Results inspire further research and suggest that EHS interventions may override the effect of these risk factors.
Funding: No funding was used for this analysis.
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Evaluation of the stability of cervical specimens collected by swab and stored dry for human papillomavirus DNA testing

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Background: Human papillomavirus (HPV) DNA testing has been recommended for cervical cancer screening in developed countries. However, HPV DNA testing is reliable on a liquid based sample collection medium, which limits the implement of this screening method used in low-resource settings. This study aims to evaluate the stability of cervical specimens collected by swab for dry storage used for HPV DNA testing.
Methods: The hospital-based, random, and parallel comparative experimental study was conducted in the National Cancer Center, Cancer Hospital of Chinese Academy of Medical Sciences & Peking Union Medical College. Women aged 20-65 with written informed consent were eligible for enrollment. Patients who were pregnant or have history of hysterectomy were excluded from participation. Patients previously referred to colposcopy for an abnormal Pap or had a HPV-positive result were also recruited. Two samples were collected for each woman using swab and CytoBrush in a random order and stored with swab sample in a tube and CytoBrush sample in cytology preserve medium. The swab and cytology specimens were randomly assigned to be stored at ambient, uncontrolled temperatures for fixed times: 2 days, 7 days, 14 days, and 28 days. The cobas HPV test (Roche) was performed to detect 14 carcinogenic HPV genotypes, including HPV16, HPV18, and 12 non HPV16/18 carcinogenic HPV types. Agreement between paired tests was evaluated by McNemar chi-square tests. Calculated by power analysis and sample size software, a sample size of 168 pairs achieves 80% power to detect an odds ratio of 3.00 using a two-sided McNeamr test with a significance level of 0.05 for each storage time point.
Findings: 695 women were enrolled in this study. The agreement rates of carcinogenic HPV, HPV16, HPV18, and non HPV16/18 carcinogenic HPV between paired tests were 93.76%, 97.82%, 99.42%, and 93.18%, with kappa values (95%CI) 0.87 (0.83-0.91), 0.94 (0.91-0.97), 0.94 (0.87-1.00), and 0.86 (0.82-0.90), respectively. There was no significant difference in the agreement of paired tests even stratified by storage time. The sensitivity and specificity for detecting cervical intraepithelial neoplasia grade 2 or worse by cytology and swab samples using cobas 4800 HPV test were 89.9% (85.5-93.4%) and 53.5% (48.6-58.4%), 91.9% (87.8-95.0%) and 52.4% (47.5-57.3%), respectively.
Interpretation: Swab collected sample storage can last up to one month without loss of sensitivity and specificity and is simple, inexpensive, and portable, which make HPV testing accessible for cervical cancer screening in low-resource setting. Due to the limit sample size of the current study, large scale study on the issue is required to confirm this conclusion.
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Quantification and characterization of the burden of traumatic injury in Haiti

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Background: The growing burden of morbidity and mortality attributed to traumatic injuries falls disproportionately on low and middle-income countries (LMICs). Trauma registries that allow for the quantification and characterization of traumatic injury are a critical part of trauma systems in high-income countries but are infrequently implemented in LMICs. In Haiti, scant epidemiologic trauma data exists; however, all patients presenting to an Emergency Room (ER) are recorded in a government-mandated logbook. The study had three aims: (1) to identify what categories of information are recorded in ER logbooks in Haiti; (2) to quantify the burden of trauma in Haiti using ER logbooks; and (3) to further characterize the epidemiology of traumatic injury in Haiti using an abbreviated trauma registry.
Methods: Photographs were taken of one week of ER logbook entries at ten departmental and tertiary healthcare facilities representing 9 out of 10 of Haiti's national departments. Data points collected were compared amongst all logbooks to identify those that were