

young women (not in school/at work). The first author interviewed 4 local service providers. Thematic analysis relied on Nvivo.

**Findings:** The most vulnerable young women experience serious difficulties accessing government support programs. Lack of self-confidence and ambiguous navigating procedures block institutional assistance. Long delays in processing applications and lack of feedback on application status are discouraging. Successful candidates experienced community-level barriers like third parties unwilling to collaborate. Although motivated to help young women, service providers complained about youth attitudes and behaviour negatively affecting support program success-rates. Agricultural support programs may be incompatible with ambitions of youth unwilling to stay in rural areas. Lack of financial, material, and human resources hamper effective assistance and follow-up of applicants. Lack of available program placements and funding contribute to delays in support. Despite their ideas for improvement, service providers believe that effective change depends on political will, and national-level coordination and direction.

**Interpretation:** The available programs involved at least five line ministries; lack of coordination results in service gaps, overlap and competition, contributing to confusion among clients. Local service providers could improve vulnerable young women's access to programs by providing targeted and accessible assistance in application procedures, followed by timely and transparent feedback on application status. Stakeholder-constructed solutions are needed to overcome identified structural barriers.

**Source of Funding:** Canadian IDRC grant nr: 107531-001.

**Abstract #:** LAN.007

### Crowdsourcing to Promote HIV Testing among MSM in China: A Pragmatic Stepped Wedge Randomized Controlled Trial of a Crowdsourced Intervention

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**Program/Project Purpose:** Improving HIV testing for marginalized populations is critical to controlling the HIV epidemic. However, the HIV testing rate among men who have sex with men (MSM) in China remains consistently low. Crowdsourcing, the process of shifting individual tasks to a group, has been increasingly adopted to enhance public health programs and may be a useful tool for spurring innovation in HIV testing campaigns. We designed a multi-site study to develop a crowdsourced HIV test promotion campaign and evaluate its effectiveness against conventional campaigns among MSM in China.

**Structure/Method/Design:** The intervention was developed using crowdsourcing at multiple stages and is being evaluated with a stepped wedge randomized controlled trial (RCT). Intervention development consisted of a nationwide crowdsourcing contest followed by a designation. The crowdsourcing contest solicited campaign content through an open call, judging, and recognition of finalist entries, which became materials for the designation. The designation adopted the concept of a hackathon and allowed individuals

to collaborate on designing a comprehensive HIV test promotion campaign. The design elements of the winning entry were included in a HIV test promotion campaign to be evaluated through a stepped wedge RCT. Eight major metropolitan cities in China will be randomized to sequentially initiate intervention in groups of two at 3-month intervals.

**Outcome & Evaluation:** 1347 MSM who are 16 years of age or over, live in the intervention city, did not have HIV testing in the past 3 months, and are not living with HIV were recruited. Recruitment took place through banner advertisements on a large gay dating app along with other social media platforms. The intervention is ongoing. Participants will complete one follow-up survey every 3 months for 12 months to evaluate their HIV testing uptake in the past 3 months as the primary outcome.

**Going Forward:** Our large-scale RCT can improve understanding of crowdsourcing's long-term effectiveness in public health campaigns, expand HIV testing coverage among a key population, and inform intervention design in related public health fields. This study has been registered on [ClinicalTrials.gov](https://clinicaltrials.gov) (NCT02796963) and obtained IRB approvals from the Guangdong Provincial Center for Skin Diseases and STI Control, University of North Carolina at Chapel Hill, and University of California San Francisco.

**Source of Funding:** NIH (#1R01AI114310-01).

**Abstract #:** LAN.008

### HIV Therapy without HBV Co-management in Ethiopia Fosters Emergence of Unintended HBV Drug Resistance and Vaccine Evasive Variants

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**Background:** Hepatitis B virus (HBV) drug resistance and vaccine escape gene mutants were determined in patients with human immunodeficiency virus (HIV) co-infection and antiretroviral therapy (ART) exposure of with unknown HBV status. Moreover, the reciprocal HIV drug resistance profiles were examined in HBV-HIV co-infected patients who developed HBV drug resistance.

**Methods:** A total of 161 hepatitis B surface antigen (HBsAg) positive sera from HIV co-infected with and without ART exposure and drug naïve HBV mono-infected individuals were characterized using direct sequencing.

**Findings:** In 35 out of 161 study subjects (21.7%) HBV drug resistance mutations (DRMs) were detected with a frequency of 1.2% rtT184S, 6.2% rtV173L, 10.6% rtL180M, 10.6% rtM204V/I and 8.1% rtI233V which confer resistance mainly for entecavir, lamivudine and adefovir. The prevalence of the major DRMs in HBV-HIV co-infected individuals (with no significance difference among ART status) was higher than mono-infected individuals (41.4% vs. 10.7%). In contrast, none of HIV-1 patients showed no nucleos(t)ide reverse transcriptase inhibitors (NRTIs) drug resistance. However, 62.5% of them developed non NRTIs resistance mutations which confer resistance to nevirapine, efavirenz, etravirine

and rilpivirine. The study also revealed higher frequency of vaccine escape gene variants (sT125S, sA128V, sQ129H/R, sT131I, sC137S, sT143M, sD144D/E, sG145R, sT148P) with the majority of them were more prevalent in HBV-HIV co-infected individuals.

**Interpretation:** The current HIV-1 therapy without considering HBV diagnosis and treatment in Ethiopia is leading to rather emergence of unintended HBV drug resistance and mutant variants which can evade HBV vaccine-induced immunity. We recommend HBV testing and co-management as part of routine HIV care programs for a better ART selection. Relatively high level of HIV-1 non NRTIs resistance profiles were observed and highlight further investigation during HBV co-infection.

**Source of Funding:** None.

**Abstract #:** LAN.009

### Serum Folate Concentrations, Asthma, Atopy, and Asthma Control in Peruvian Children and Adolescents

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**Background:** Asthma has become increasingly prevalent in low- and middle-income countries (LMICs). Folate may increase asthma risk through epigenetic mechanisms. Recent research has examined the relationship between folate status and asthma-related outcomes; however, this relationship has not been examined in LMIC settings.

**Methods:** We analyzed serum folate concentrations in 412 children with asthma and 342 children without asthma from two geographically adjacent communities in Lima, Peru. We assessed atopy, total IgE, pulmonary function, FeNO, and asthma control using the Asthma Control Test (ACT). We defined controlled asthma as ACT score > 19. We conducted longitudinal monthly follow-up of children with asthma (n=412) for 6–9 months and recorded healthcare utilization for asthma. We examined associations between folate and asthma, atopy, pulmonary function, FeNO, total IgE, and odds of one or more emergency visits for asthma during follow-up using multivariable logistic and linear regression.

**Findings:** Mean serum folate concentration levels were 20.1 ng/mL (SD 4.98) and 21.1 ng/mL (SD 4.93) in children with and without asthma, respectively. Multivariable analysis showed a 10 ng/mL decrease in serum folate was associated with 45% increased odds of having asthma (OR=1.45, 95% CI 1.05–2.02; p=0.03). Atopy was an effect modifier in the folate–asthma relationship; a 10 ng/mL decrease in serum folate was associated with a 2.38-fold increase in odds of asthma among children without atopy (OR=2.38, 95% CI 1.20–4.72; p = 0.01) and 23% increased odds of having asthma in children with atopy (OR=1.23, 95% CI 0.85–1.80; p=0.28). Among children with asthma, a 10 ng/mL decrease in serum folate was associated with 40% decreased odds of controlled asthma (OR=0.60, 95% CI 0.38–0.95; p = 0.03) and 73% increased odds of one or more emergency visits for asthma

during follow-up (OR=1.73, 95% CI 1.05–2.85; p = 0.03). Serum folate levels were not statistically significantly associated with atopy, pulmonary function, FeNO, or total IgE.

**Interpretation:** Serum folate concentrations were inversely associated with asthma, but this effect was stronger in children without atopy. Among children with asthma, higher serum folate concentrations were positively associated with asthma control. Future studies are needed to better understand possible mechanisms for folate–asthma relationships.

**Source of Funding:** This project was funded by a grant from the NIEHS, NIH (R01ES018845, R01ES018845-S1).

**Abstract #:** LAN.010

### Evaluation of Self-medication with Antibiotics among Adults in Kosovo

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**Background:** The practice of using antibiotics without a prescription and antibiotic resistance are related public health problems in developing Eastern European countries. Self-medication with antibiotics is also an important factor driving antibiotic resistance. The aim of the present study was to estimate the prevalence of purchase of antibiotics without prescription and evaluate the knowledge regarding antibiotics among Kosovo adults.

**Methods:** A questionnaire was developed with validated questions from previous studies to assess level of purchase and use of antibiotics without prescription. The questionnaire was translated into the Albanian Language and then translated back to English to control for possible errors. A group of experts from the WHO office in Kosovo reviewed the questionnaire and it was determined to have face validity. Surveys were self-administered through a web link and were distributed and advertised through social media. Six hundred and sixty three (n= 663) respondents from Kosovo accessed the online link, between June 2016 to July 2016. The study includes data from 425 respondents (253 women/ 172 men, 55.53% were between 25–45 years of age, 34.59% were between 18–25 years, 8.94% were between 45–60 years, and 0.94% were >60 years).

**Findings:** Out of 425 participants, 249 (59%) self-medicated with antibiotics. The most common reasons for self-administration of antibiotics were sore throat 186(45.70%), cough 30 (7.37%), and pain 29 (7.13%). The antibiotics most frequently used for self-medication were Amoxicillin (41.78%), Amoxicillin/Clavulanic Acid (23.45%), Ampicillin (13.21%), and Ciprofloxacin (5.93%). The major source of self-medication was the pharmacy, where they purchased antibiotics without a prescription (91.56%). 39.23% of them have changed the type of antibiotic during the same treatment, 36.36% of them have changed the dose of the antibiotic when self-treated and 32.91% of them answered to have used the same antibiotic with different brand name at the same time.

**Interpretation:** The current prevalence of self-medication among adults in Kosovo, the lack of awareness about the risks and the