Background: Molecular epidemiology has revolutionized the understanding of Mycobacterium tuberculosis (MTB) transmission. Such studies require culture-based genotyping results from the majority of the study population to generate valid inferences. The present investigation aims to describe factors that influence confirmatory culture results within The Kopanyo Study, a large molecular epidemiological study of MTB in Botswana.

Methods: We performed liquid culture for MTB confirmation and isolation among patients initially diagnosed with TB in routine clinical practice. Multiple sputum samples were collected per patient to account for variability in sputum production and contaminated samples. Data were gathered via chart review from 29 clinics in Botswana for patients enrolled between September 1st 2012 and August 31st 2013. Generalized estimating equation (GEE) logistic regression modeling was used to determine factors associated with MTB culture positivity while accounting for multiple samples collected for each patient. This research was approved by the Ethics Committees and Independent Review Boards at the University of Pennsylvania, Centers for Disease Control and Prevention, Botswana Ministry of Health, University of Botswana and Princess Marina Hospital. All study participants provided informed consent.

Findings: A total of 1,338 samples collected from 574 TB patients were included in the analysis. Overall, 435 (75.8%) patients had at least one MTB positive culture. Among HIV-infected patients 197/278 (70.9%) were culture positive, whereas among HIV-uninfected patients 156/186 (83.9%) were culture positive (p < 0.01). The median time between diagnosis and initiation of culture was four days (interquartile rage 2 - 6). Among mucopurulent and salivary (clear, mucoid, blood-stained or salivary) samples, 554/738 (75.1%) and 336/548 (61.3%) were culture positive, respectively (p < 0.01). In patients who underwent sputum induction via respiratory methods or gastric aspiration 89/193 (46.1%) were culture positive, while 438/596 (73.5%) who voluntarily expectorated sputum were culture positive (p < 0.01). In multivariate analysis, HIV-infection (OR=0.53 95% CI = 0.32 − 0.88), age (21-30 years vs.

Interpretation: We found that age 21-30 years, HIV-infection, and sputum collection method are factors that must be taken into consideration in studies using MTB isolation. Improved methods of MTB culture detection are necessary for HIV co-infected populations and others with low levels of bacilli in the sputum.

Socio-economic, clinical, and behavioral factors associated with study retention among tuberculosis patients in Botswana

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Background: Prospective cohort studies are crucial for expanding the understanding of tuberculosis (TB). High level of patient retention throughout the study period is vital to maintain study power and draw valid conclusions. In this study we aim to define factors associated with mid- and long-term participant retention to identify patients at risk of being lost to follow-up in a large cohort TB study in Botswana.

Methods: We conducted a nested cross-sectional study of clinical and research records of culture positive TB patients enrolled from Sep 1, 2012 − Aug 31, 2013. Participants were recruited after being diagnosed with TB at one of 32 clinics in the greater Ghanzi and Gaborone area. All diagnosed patients were eligible for enrollment. Factors studied included sex, age, location, smoking status, alcohol consumption, previous incarceration, income, previous TB, HIV status, and antiretroviral therapy use. Patient retention among the cohort is attempted at 6-month intervals. Study retention was analyzed for patients enrolled in the study for at least 12 months with complete data entry and was defined in two ways: 1) evidence of at least one follow-up visit; and 2) continued retention at 12 months after enrollment. Of the 1,092 patients enrolled during the time period, 270 fulfilled requirements for analysis. Descriptive analysis and chi-square tests were performed. This research was approved by the Ethics Committees and Independent Review Boards at the University of Pennsylvania, Centers for Disease Control and Prevention, Botswana Ministry of Health, University of Botswana, and Princess Marina Hospital. All study participants provided informed consent.

Findings: Overall, 200/270 (74.1%) participants had at least one follow-up visit and 124/270 (45.9%) participants were retained at 12 months. Female sex (69.2% vs. 78.0% among males; p=0.100) and HIV infection (69.2% vs. 84.3% among HIV-uninfected participants; p=0.011) were negatively associated with having at least one follow-up visit. Female sex (38.3% vs. 52.0% among males; p=0.025) and living in a rural setting (24.2% vs. 48.7% among participants living in an urban setting; p=0.008) were negatively associated with retention at 12 months.

Interpretation: Findings suggest that improved efforts are needed to increase cohort study retention for female, HIV-infected, and rural participants. Limitations of the current study include incomplete data entry forms that skew eligible participants to the beginning of the study period.

HIV and early hospital readmission: Evaluation of a tertiary medical facility in Lilongwe, Malawi

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Background: Delivery of quality healthcare in resource-limited settings is an important, understudied public health priority. Thirty-day (early) hospital readmission is often avoidable and an important indicator of quality. At Kamuzu Central Hospital (KCH), a tertiary

hospital in Lilongwe, Malawi, we analyzed readmission patterns in the inpatient medicine wards. We described the prevalence of early readmissions, assessed factors associated with readmissions, and explored the impact of HIV/AIDS on readmission.

Methods: We investigated the prevalence of and factors associated with all-cause early readmission using regression models with a log link and binomial distribution to estimate risk ratios (RR) and 95% confidence intervals (CI). A retrospective review of the medical ward database at Kamuzu Central Hospital was conducted between February and December 2013.

Findings: There were 3547 patients with an index admission and 74.4% of these survived and were eligible for readmission: 48.1% female, mean age 40.8, 38.5% HIV-infected. The prevalence of early hospital readmission was 5.5%. Persons who were HIV infected were more likely to experience an early readmission (9.2%) than those who were HIV-uninfected (3.5%) or with an unknown HIV status (3.3%). Factors associated with 30-day readmission were being HIV-positive (RR=2.59; 95% CI: 1.74- 3.83), comorbidity (RR=1.52; 95% CI: 1.11-2.06), and prolonged length of stay (14 days) at the index hospitalization (RR=5.01; 95% CI: 2.38, 10.53).

Interpretation: Targeting HIV-infected inpatients with comorbid conditions and longer index admissions may prevent early readmission and improve quality of care. Further investigation is needed to identify quality improvement initiatives.

Abstract #: 02CD005

Companion animals and home surface contamination in community-associated methicillin-resistant Staphylococcus aureus colonization of people

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Background: Households are increasingly recognized as sources of community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA). This study was conducted to identify MRSA on home surfaces and pets of patients newly diagnosed with a CA-MRSA skin or soft-tissue infection (SSTI), and to evaluate these as risk factors for MRSA colonization in people over time.

Methods: Surfaces and pets were sampled in homes enrolled in a three-arm non-blinded randomized controlled trial (NCT00966446) that evaluated household-wide decolonization of people. Index patients (adults and children) with MRSA SSTI and their household members were recruited from five U.S. hospitals during 2012. Prior to randomization and three months later, eight standardized home sites were sampled using autoclaved electrostatic cloths. All pets were swabbed at multiple anatomic sites. Broth-enrichment culture was performed to identify staphylococcal isolates. PCR methods were used for staphylococcal speciation (nuclease gene) and methicillin resistance (mecA/mecC genes). Unadjusted and adjusted logistic regression analysis was used to evaluate risk factors for MRSA colonization in patients and household members. University of Pennsylvania and Johns Hopkins University IRB and ACUC approved this study. Participants provided written informed consent.

Findings: Baseline MRSA prevalence rates were 34% (30/88) of index patients and 26% (78/301) of household members. At baseline, 53% (47/88) of homes were MRSA contaminated at one or more sites, 10% of homes had MRSA-positive pet(s), and 19% had pet(s) carrying the veterinary pathogen Staphylococcus pseudintermedius. People living in MRSA-contaminated homes had 3.9-times higher adjusted odds of being MRSA colonized, versus those in uncontaminated homes ([95% CI: 1.80, 8.53], p=0.001). Having a pet with S. pseudintermedius was associated with a protective effect (aOR 0.35 [95% CI: 0.14, 0.87], p=0.01). Three-month MRSA prevalence rates were 31% (17/55) of index participants and 15% (27/183) of household members. At three months, 44% (24/55) of homes were MRSA contaminated, 9% had MRSA-positive pet(s), and 24% had pet(s) carrying S. pseudintermedius. People living in MRSA-contaminated homes had 4.4-times higher adjusted odds of MRSA colonization [95% CI: 1.97, 9.78], p=0.001). Living with MRSA-positive pet(s) was associated with 4.1-times higher adjusted odds [95% CI: 1.26, 13.2], p=0.02). Having more pets in the home was associated with a protective effect (aOR 0.75 [95% CI: 0.59, 0.96], p=0.02).

Interpretation: This is the largest study that has tested pet carriage and home contamination with MRSA colonization in people. It is unique in its detailed assessment of pet staphylococcal carriage. MRSA colonization in people was associated with MRSA-contaminated homes and MRSA-positive pets. Having pets with S. pseudintermedius, or having more pets in the home, offered protection against colonization in people. Interventions that target home environments and MRSA-positive pets warrant further investigation as strategies to curtail human MRSA.

Abstract #: 02CD006

Community-based social mobilization and communications strategies utilized in the 2014 West Africa Ebola outbreak

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Background: The current Ebola epidemic in West Africa has presented a major public health challenge to both the affected countries and the international health community at large. Unfortunately, the bulk of previous research has centered on clinical care, transmission risks, and epidemiological tracing due to the immediacy of addressing patient needs. Minimal efforts have focused on evaluating community-based social mobilization strategies in real-time, which present a crucial aspect of breaking transmission chains and increasing awareness. This study aimed to characterize and assess the methods utilized in the current Ebola response operation by depicting the experiences and perspectives of local Guinean Red Cross (CRG) volunteers and primary response staff working on the frontline of the outbreak.

Methods: The authors performed a qualitative study in Guinea, consisting of interviews and focus groups in Conakry and Guéckédou, the original outbreak epicentre and location of the primary Ebola treatment center. Additional recruitment was conducted at the International Federation of the Red Cross (IFRC) Africa Zone office in Nairobi. Study participants were identified through expert purposive and convenience sampling methods, and included: IFRC staff in Guinea, Nairobi, and Geneva; local CRG staff and volunteers; Ministry of Health personnel; staff from other major international humanitarian partner organizations working in Guinea; and community members. Due to the immediate nature of the outbreak and time-sensitivity of response activities, only verbal informed consent was obtained.