

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.

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**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.

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**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.

**Findings:** Data from 63 unique study participants, including 27 individual interviews and five separate focus groups, were analyzed. Major themes supported the effectiveness of community-based prevention strategies in community uptake of key messages. Successful approaches for targeting reticent subpopulations included enlisting support from religious leaders and village elders to secure trust from community members. Bidirectional, dynamic methods of communication were also identified as essential characteristics of behaviour change, rather than relying on static materials such as informational posters and pre-taped PSAs. Messages focusing on the lethality of disease were found to reduce essential care-seeking behaviours.

**Interpretation:** Local Red Cross volunteers and staff are ideally placed for social mobilization efforts to prevent transmission, combat misinformation in the event of an Ebola outbreak. They often have an established relationship with community members and understand the anthropological background, which can be a challenge for incoming foreign aid workers. The community-based work of this cadre is an essential component of the response effort complementary to the clinical work. Findings and lessons learned from this research provide the groundwork for continuing response efforts, as well as for future Ebola and infectious disease outbreaks in similar international settings.

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**Abstract #:** 02CD007

### Unpacking the care cascade: Late presentation to care among HIV-infected drug users in a large urban center of Brazil

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**Background:** Global and national policies have highlighted the importance of the HIV care cascade to achieve viral suppression and reduce transmission risk. While many HIV-infected people, including drug users, continue to experience delays in accessing services, it remains unknown if risk factors associated with late presentation differ at distinct stages of care. To inform the provision of services, we investigated how risk factors for delays or interruptions in care are similar and different along the care cascade of HIV-infected drug users.

**Methods:** Data were collected in a cross-sectional study of HIV-infected individuals aged 18 or older and enrolled in HIV/AIDS care at one of three main health facilities in Salvador, Brazil. Eligible participants (n=1970) were interviewed between August 2010 to June 2011. 363 individuals reported drug use at least once in their lifetime. Descriptive and bivariate statistics were conducted to identify risk factors associated with late presentation to different stages of the care cascade among HIV-infected drug users. Late diagnosis, late enrollment, and non-adherence to medication served as measures for experiencing interruptions in care. Covariates explored included socio-demographic profiles, drug usage, sexual health, and health service quality.

**Findings:** 363 participants, 269 men and 94 women, reported ever using amphetamines/cocaine (n=214, 59.0%), crack (n=87, 24.0%), injecting drugs (n=56, 15.4%), marijuana (n=291, 80.2%), LSD/mushrooms (n=34, 9.4%), or other drugs (n=45, 12.4%). For late testing, male gender (2.54 OR, 1.2-5.4 95%CI) significantly increased odds for late diagnosis, while crack usage (0.41 OR, 1.2-5.4 95%CI), experiencing forced sex (0.38 OR, 0.2-0.9 95%CI), and confidential testing (0.43 OR, 0.2-0.8 95%CI) decreased odds. For late

enrollment, unemployment (2.45 OR, 1.0-2.5 95%CI), amphetamine/cocaine usage (1.62 OR, 1.0-2.5 95%CI), and experiencing forced sex (1.95 OR, 1.1-3.5 95%CI) increased odds, while male gender (0.46 OR, 0.3-0.8 95%CI), and post-test counseling (0.50 OR, 0.3-0.9 95%CI) decreased odds. For non-adherence, smoking tobacco (1.92 OR, 1.1-3.5 95%CI) and experiencing forced sex (2.40 OR, 1.2-4.9 95%CI) increased odds.

**Interpretation:** Risk factors for late presentation among HIV-infected drug users differed at each stage of the care cascade. Some variables, including male gender and experiencing forced sex, were negatively associated with engagement in care at one stage and positively at another. Early provision of quality health services, including confidential testing and post-test counseling, had positive effects across stages of care. Identifying how risk factors for late presentation differ at each stage of the care cascade can inform changes in service provision that improve care continuity, facilitate achievement of viral suppression, and reduce HIV-related morbidity and mortality globally.

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### Epidemiological dynamics of bovine brucellosis in India

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**Background:** Bovine brucellosis is a worldwide, zoonotic disease with significant economic and global health impact. As a predominantly agrarian society, India faces many health-related and socio-economic challenges in managing livestock disease. Mathematical modeling of livestock diseases in developing regions can provide valuable insight into infectious disease dynamics and disease management strategies; these findings help decision-makers in improving public health policy. Our objective was to develop an epidemiological model of brucellosis transmission dynamics among cattle in India, and to estimate the impact of various control strategies. Control strategies include test-and-slaughter, reducing transmission rate, and mass vaccination.

**Methods:** Data collection and analysis was conducted at Madras Veterinary College in Chennai, India. We developed a deterministic, susceptible-infected-recovered model to simulate brucellosis transmission dynamics in cattle in India, calibrated to endemically stable levels of bovine brucellosis prevalence of 13.5% in India. We then analyzed the epidemiological benefits at various rates of transmission reduction and mass vaccination.

**Findings:** While test-and-slaughter is an effective control strategy, socio-cultural constraints in India forbid culling of cattle on religious grounds. Reducing transmission rates lowered disease prevalence correspondingly, and a one-time vaccination initially lowered prevalence but increased with influx of new susceptible births over time. Reducing transmission among cattle either by restricting movement and contact rate or through vaccination decreases the burden of bovine brucellosis in India.

**Interpretation:** Vaccination is an effective strategy to eliminate bovine brucellosis in India, but it must be implemented at regular intervals. One potential management strategy may be restricting herd density, although further study is necessary to establish density-dependent effects on disease transmission. A main limitation of this study is lacking data on disease prevalence and population dynamics of livestock. The governmental ban on cow slaughter presents a significant obstacle within this analysis as well as potential management outcomes; nonexistent records