

**Background:** In order to reduce mortality among HIV/AIDS patients, it is imperative to understand the cause of mortality in these individuals. In this study, we reviewed clinical characteristics and outcome of HIV/AIDS inpatients in a tertiary hospital setting in Ethiopia in 2008.

**Methods:** Retrospective medical chart review was done for HIV-infected patients admitted to the All Africa Leprosy, Tuberculosis and Rehabilitation training (ALERT) Centre, a tertiary referral hospital in Addis Ababa, Ethiopia from January 1 to December 31 in 2008. Basic information (sex, age etc), HIV profile (CD4 count, WHO stage, ART regimen etc), presenting symptoms, diagnosis, and outcomes were obtained, and the data were analyzed. Ethical approval was obtained from the Albert Einstein College of Medicine, ALERT Centre and the Ethiopian National Review Board.

**Findings:** A total of 290 HIV positive patients admitted to the ALERT Centre in 2008 were included in this study. Out of the total patients, 187 of them had been on ART prior to admission (the ART group), and 103 of them were not on ART (the non-ART group). The mean CD4 count was 142.9 cell/mm<sup>3</sup> for the ART group and 101.6 cell/mm<sup>3</sup> for the non-ART group ( $p=0.002$ ). The distribution of WHO stage was similar between the ART and non-ART groups; more than 90% of patients in both groups were either WHO stage III or IV. For overall patients, bacterial pneumonia (27.9%), all-extrapulmonary TB (26.9%), pulmonary TB (26.0%) and bacterial sepsis (18.6%) were the most common diagnosis. About 70% of TB diagnoses and more than 90% of CNS diagnoses were made empirically. The mortality was 36.4% for the ART group and 59.2% for the non-ART group ( $p=0.000$ ). The highest mortality was associated with final diagnoses of bacterial sepsis (61.4%) followed by CNS diagnoses (58.1%), pulmonary TB (53.7%), bacterial pneumonia (52.7%) and all-extrapulmonary TB (51.2%). About 60% of the ART group showed improvement during the admission; only 35% of the non-ART group showed improvement ( $p=0.000$ ).

**Interpretation:** The non-ART group was associated with higher inpatient mortality than the ART group. Nevertheless, both groups had extremely high death rate with the overall mortality rate of 44.5%. The majority of patients presented at advanced stage of HIV disease, and the majority of the diagnoses were made empirically. In addition, more than half of the patients were diagnosed as co-infected with TB. Better diagnostic tools and treatment options will likely improve the outcome of HIV patients in Ethiopia. Of paramount importance is the implementation of the June 2013 WHO guideline to enroll people on ART with the CD4 count less than 500 cell/mm<sup>3</sup> before their immune system is severely immunocompromised.

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**Abstract #:** 02CD012

### Effect of fluoride varnish on early childhood caries in immunization clinics of roatan, Honduras

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**Background:** Early childhood caries (ECC) is a common chronic infectious disease worldwide with a higher burden in lower income countries. Fluoride varnish (FV) can effectively prevent ECC, but access is often limited. Early childhood vaccination programs are often well established in developing countries and the incorporation of FV into immunization facilities can play a significant role in improving early childhood oral health. The aim of this study was to assess the feasibility and utility of incorporating FV application in vaccination clinics to prevent ECC in Roatán, Honduras.

**Methods:** In a pilot observational study, 183 children aged 6-72 months were recruited from two Roatán public vaccination clinics. Some of these children had previously received FV with their regularly scheduled vaccination as part of a recent ad hoc oral health program. Study participant's demographics, diet, oral health habits, FV exposure, height, weight, and health information were collected via provider interviews, medical chart reviews, and physical exams. Caries scores were recorded using modified ICDAS. Data were analyzed using SPSS 17.0.

**Findings:** Of the 178 (97%) children who were vaccinated, only 34 (19%) received FV. Caries prevalence increased with the age. Children who received FV had significantly lower dmft (mean±SE: 2.45±0.09 for FV vs. 5.35±0.08 for non-FV, Mann-Whitney,  $P < 0.001$ ) and lower caries prevalence (45% for FV vs. 69% for non-FV, Chi Square,  $P < 0.01$ ). Parent education, frequent soda and juice intake, and frequent snacking were positively associated with ECC while daily intake of milk was inversely associated with ECC.

**Interpretation:** Children who received FV in vaccination clinics in Roatán, Honduras had significantly less ECC compared to children who did not receive FV. However, the percentage of children who received FV was low compared to vaccination coverage. Education on healthy diet and the expanded use of FV in vaccination clinics can help reduce ECC in young children of Roatán, Honduras.

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### The impact of immunity against mosquito salivary proteins on dengue transmission

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**Background:** Dengue is a mosquito-transmitted disease of the tropics and subtropics caused by dengue virus (DENV). In endemic areas, this disease has become the leading cause of childhood morbidity and mortality. In South America, DENV is primarily maintained between humans and *Ae. aegypti* and *Ae. albopictus*. While the majority of DENV infections result in little or no disease, a small proportion of infections progress to the severe forms, hemorrhagic fever or shock syndrome. There is no specific therapeutic agent available against dengue virus, and vaccine development has been continually hampered by safety issues. An important and relatively unexplored area in DENV research is the role of arthropod vector factors in DENV infection and disease outcome. During feeding, the mosquito deposits salivary proteins (mSP) in human skin to facilitate bloodmeal intake. These mSP stimulate immune responses, which may lead to antibody production and modulation of cellular and cytokine function, which in turn can have a strong effect on viral infectivity. We propose that, in endemic settings, after repeated exposure of mosquito bites hosts develop an immune response against mosquito salivary proteins that can modulate or even block dengue viral infectivity. Here, we evaluated the antibody levels in human patients against specific mosquito salivary proteins that were found to be downregulated during mosquito DENV infection.

**Methods:** After informed consent was voluntarily given, a serum sample was obtained from 80 febrile patients with probable dengue diagnosis from Los Patios Hospital in Norte de Santander Colombia and 10 controls living in the same area. DENV infection was detected by qRT-PCR. ELISA test was performed to evaluate the level of antibodies against Aegyptin, ADA and C-Type Lectin proteins from *Ae. aegypti*.

Purified anti-mSP antibodies were incubated with each protein in the presence of DENV to measure blocking activity of such antibodies.

**Findings:** In febrile subjects, antibody levels against C-type Lectine were higher in control subjects (n=23) than in febrile (n=34) and DENV-infected (n=48) participants (p=0.0422). In contrast, antibodies against Aegyptin were significantly higher in DENV-infected (viremic) patients (p=0.0266). Interestingly, we found that antibodies against ADA were not significantly different among groups (p=0.3769). In vitro testing showed a decrease of DENV infectivity in Vero cells exposed to mSP if they had been preincubated with antibodies (p=0.0361)

**Interpretation:** In the field, humans are exposed predominantly to uninfected mosquito saliva via mosquito bites. In the mosquito vector, DENV infection alters the expression of salivary proteins. Chronic exposure to either normal or modified saliva proteins induce an immune response that may protect or predispose people to excessive viremia and severe symptoms during DENV infection.

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### An evaluation of children's personal health practices and school performance in a public primary school in Kisoro, Uganda

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**Program/Project Purpose:** The right to health is listed in the Universal Declaration of Human Rights as a right to which all human beings are entitled. Unfortunately, this right has failed to be realized in much of the developing world due to poor knowledge of citizens regarding health and hygiene, as well as a lack of adequate resources and facilities. This has ultimately led to the spread of communicable diseases and continues to plague much of the African continent.1 According to the World Health Organization (WHO), in 2008, the percent of deaths due to communicable diseases was 8% in developed countries compared to 68% in developing parts of the world.2 In the same year in Uganda, the WHO reported the percent of deaths resulting from communicable diseases, such as lower-respiratory infections and diarrheal diseases, to be 76%.3 Children in particular bear a disproportionate amount of the disease burden due to inadequate sanitation and insufficient hygiene leading to school absenteeism and in severe cases, death.4, 5 Past studies among school-aged children in Colombia, Ethiopia, and Kenya have shown that despite an awareness of the importance of hygiene, very few children actually practice an adequate amount of sanitation.

**Structure/Method/Design:** This study employed the KAP (Knowledge, Attitudes, and Practice) model at Katarara Primary School, a government funded school located in Kisoro, Uganda, to evaluate hygiene practices, student background, and school attendance and performance in 119 students using a survey instrument. Students from grades 4 through 6 were recruited using an informed consent process with the help of a local translator. The survey was administered orally with the help of the translator.

**Outcomes & Evaluation:** Although no association was found between health practices and school performance, a surprising percent (100%) of students were aware of the health consequences of unhygienic behavior. This knowledge of the students attests to the strong health education program at Katarara. However, the students did not have an opportunity to employ their knowledge to perform safe health practices due to limited facilities at the poorly funded government school.

**Going Forward:** The second part of this project was to inform an interventional and education program on safe and effective hand washing techniques. Hand washing stations supplied with soap and water were built on school grounds in an attempt for students to employ their health knowledge to effective health practices. A follow up study on the effectiveness of the intervention in improving hygienic practices as well as a study comparing these results to the health knowledge and practices of students in schools across the country would better inform a public health initiative in Uganda in reducing the spread of communicable diseases.

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### Effectiveness of provider initiated HIV testing and counseling in children in Cameroon

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**Background:** In 2011 in Cameroon, only 13.8% of children eligible for antiretroviral therapy (ART) actually received it. Barriers to children receiving ART include delayed diagnosis and parents refusing HIV testing for their children. Provider initiated HIV testing and counseling (PICT) refers to HIV testing and counseling routinely recommended by health care providers to persons attending health care facilities as a standard component of HIV care. PICT helps in early identification of HIV-infected children, facilitates follow-up care and prevention measures that will ensure that children remain uninfected and healthy. The PICT approach also aids in early initiation of ART in infected children and parents. To date, no study has been conducted at a regional or national level in the pediatric population with regards to HIV testing using the PICT approach. The purpose was to evaluate HIV testing rates after PICT.

**Methods:** A descriptive cross-sectional pilot study of 5 month duration (September 2012 to January 2013) was conducted in the Regional Hospital Limbe. The Regional Hospital Limbe is a major referral hospital providing healthcare in the Southwest Region of Cameroon. Its pediatric unit records an average of 550 admissions per year. All hospitalized children aged 2 months to 15 years within the study period were recruited. Authorization to conduct study was obtained from the regional delegation of health and the administrative authorities of the hospital. After acquiring parental/legal guardian informed consent (written and/or verbal), blood samples from children and their parents were tested using an HIV rapid test following the national algorithm. For infants

**Findings:** The participants were 128 hospitalized children. The mean ( $\pm$ SD) age of the children was 57( $\pm$  48) months. Of the 128 children, 52% were female. Children were accompanied by their mothers (70%), fathers (20%), and grandparents/aunts (11%). Of the 128 children, 17 (13%) had previously been tested for HIV, 4 of whom were HIV positive. In the current study, parents accepted HIV testing for 110 of the remaining 111 children, of whom 5 were HIV positive. One of 15 mothers tested was HIV positive.

**Interpretation:** Parents and caretakers of hospitalized children nearly universally accepted the recommendation to test their children for HIV, and were willing to be tested themselves. This study identified 5 additional children with HIV infection, more than doubling the number of children with diagnosed HIV infection in this group. This study showed a higher acceptance of HIV testing compared to previous reports, possibly related to competent, on-site PICT. In contrast to other studies in this area, a small sample size and shorter duration of follow-up are major limitations. Given