

### Comparative evaluation of RT-LAMP and RT-PCR for Detection of HIV-1 in the Sudan

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**Background and purpose:** Rapid, simple, cost effective, nucleic acid based test for detecting HIV-1 in areas with limited resources is badly needed. Loop-mediated isothermal amplification (LAMP) is a technique that allows the amplification of nucleic acids DNA and RNA with high specificity, sensitivity and rapidity under isothermal conditions. This study was conducted to evaluate RT-LAMP method for HIV-1 detection in comparison with RT-PCR.

**Methodology:** In the present study, ninety EDTA blood samples were studied; seventy samples were collected from HIV-1 infected patients and 20 samples from HIV-1 negative participants. All samples subjected to RT-LAMP and RT-PCR assay targeting HIV-1 p24 gene. Additionally nine positive samples were subjected to viral load measurement using COBAS<sup>®</sup> TaqMan<sup>®</sup> HIV-1 Test, version 2.0 (v2.0), and five samples were subjected to direct DNA sequencing of p24 gene phylogenetic analysis.

**Results:** Of the 70 HIV-1 positive samples, 68 (97.1%) and 61 (87.1%) positive samples were detected using RT-LAMP and RT-PCR respectively. Whereas, all the 20 HIV-1 negative samples were confirmed negative by RT-LAMP, 2 (10%) were positive by RT-PCR. Furthermore, the limit of detection (LOD) for both RT-LAMP and RT-PCR assays was determined to be 130 and 325 copies/ml respectively. The viral loads for the nine samples ranged between 1.92E+4 C/ml – 1.04C6/ml. The sequencing of five samples showed similarity of the Sudanese isolates with the neighboring countries Uganda, Saudi Arabia and also Senegal and even more closely sub-grouped with the Tanzanian counterpart.

**Conclusion:** RT-LAMP was successfully performed under minimal laboratory conditions demonstrating it as a very useful for use in fields setting and limited resources region.

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### The effects of meteorological variables on bacterial intestinal infectious disease related to emergency room visits in Seoul, South Korea

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**Objectives:** To better understand the effects of meteorological factors (average air temperature (°C), relative humidity (%), average precipitation level (mm) and average wind speed m/s) on weekly reported emergency room visits of all bacterial enteritis (ICD-A00 to ICD-A05) obtained from 30 hospitals in Seoul, South Korea from 2009 to 2014.

**Methods:** After controlling for potential confounding factor, GAM generalized additive model was used to evaluate the association between weekly emergency room visits (data were extracted from NEDIS data-base) and meteorological factors (data were received from Korea meteorological administration). Both single day and distributed lag models were explored over a previous one and two weeks.

**Results:** Weekly emergency room visits reported cases are 2646 (53% is female), distributed as ICD's codes (ICD-A00 Cholera 29, ICD-A01 Typhoid and paratyphoid fever 58, ICD-A02 Salmonella infection 140, ICD-A03 Shigellosis 32, ICD-A04 Other bacterial intestinal infection 1954 and ICD-A05 Other bacterial foodborne intoxication 450), most reported cases under age group 19–64 years (51%) and least group under age 7–12 years old (5%). A statistically significant positive association existed only between emergency bacterial enteritis cases and bacterial enteritis cases. The cumulative summary of Relative Risk estimated for average air temperature above 10 °C is 1.008 (95% CI: 1.01 to 1.003) and below 10 °C is 0.97 (95% CI: 0.99 to 0.96), and for an Excess Risk estimated (for 1 °C increase above 10 °C being 0.85% (95%CI: 1.3% to 0.40%) increase in ER visits and a negative effect was observed for air temperature below 10 °C, for increase 1 °C was –2.4% (95% CI: –0.85% to –3.9%).

**Conclusion:** This study suggests that air temperature has an effect of ER visits related to bacterial enteritis, while other meteorological factors (relative humidity, average precipitation level and average wind speed) were observed statistically non-significant.

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### Epidemiologic characteristic of human Middle East respiratory syndrome in Saudi Arabia, 2015–2017

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**Objective:** To estimate the incidence and mortality of human Middle East respiratory syndrome (MERS) cases by demographic characteristics, regions and sources of infection in Saudi Arabia.

**Methods:** MERS cases and their characteristics were extracted from two data sources; World Health Organization and Ministry of Health, Saudi Arabia. The incidence and mortality per 100,000 were calculated by age, gender and region. We also compared the epidemiologic characteristics by source of infection.

**Results:** Total 829 cases from 2015 to 2017 were recruited in this study. Incidence of MERS infection was 1.44, 0.65, and 0.54 case/100,000 population for 2015, 2016 and 2017 respectively. The mean age of cases was 55 years, highest incidence rate was founded among age group 50–59 years old (22.5%), and lowest incident in age group ≤ 19 years. Male gender is more likely to be infected with 73.5% of all cases. Majority of incident rate was

