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Introduction and purpose

- Acute respiratory tract infection (ARTI) represents the most common acute illness encountered in childhood (1). ARTIs range from self-limited catarrhal syndrome to life threatening pneumonia.
- The frequently reported viruses in children under 5 years with ARTI are respiratory syncytial virus (RSV), parainfluenza types 1, 2 and 3 (PIV), adenovirus (AV), influenza A and B (In A and B), coronavirus (CoV), Coxsackie virus, rhinovirus, enterovirus, human boca virus (hBoV) and human metapneumovirus (hMPV) (2,3).
- This study was undertaken to identify the viral aetiology and the burden in childhood ARTIs with a view of mapping the local seasonality.

Methods

- Nasopharyngeal aspirates (NPA) of inward patients (1 month - 5 years) with ARTI were collected in Teaching Hospital, Gampola (THG) and Professorial Unit, Teaching Hospital, Anuradhapura (THA) from March 2013 - August 2014.
- The viral causes were detected by screening the NPA with indirect immunofluorescence assay (IFA), DAKO IMAGEN™ (UK) and the specific virus causing the ARTI was identified by direct immunofluorescence assay (4) using the screening positive NPAs.
- IFA negative NPA samples (n=100) were tested for hMPV, hBoV and CoV. Viral seasonality with associated risk factors were compared to the total viral burden and then RSV burden and others (5).
- The descriptive statistics were expressed using measures of central tendency and step wise logistic regression to detect the risk factors for development of ARTI.

Results

- Out of 861 NPAs tested from both cohorts, 330 children had viral etiology as screened by IFA. RSV was detected in 179 children with ARTI from both cohorts together and other viruses including parainfluenza types 1, 2 and 3, adenovirus, influenza A and B and hMPV accounted for the rest of the viral screening positive children (Figure 1).
- Out of 443 and 418 NPAs tested from both cohorts, RSV was detected 94 (59.96 %) in THG and 85 (51.51%) in THA. In both cohorts RSV was detected throughout the year. In wet zone (TAG) the peak incidence was detected in May-July in 2013 and 2014 (Figure 1).
- Spearman's correlation and multiple linear regression showed a positive correlation for the monthly RSV cases with the number of rainy days in the study area of the THG cohort. An inverse correlation for the monthly RSV cases was observed with the mean atmospheric temperature in the study areas of both THG and THA cohorts (Figure 2).
- Period prevalence of RSV ARTI in THG was 4.7 % and in THA was 4.25 %. The RSV incidence at THG and THA was 31.3 and 28 /100000 person years, respectively. Other viral aetiologies did not follow a clear seasonality. However, the hMPV distribution was similar to that of RSV in both THG and THA cohorts.
- Compared to RSV, acquisition of adenoviruses in both cohorts was high among children with low birth weight, malnutrition, living in crowded environment, attaining day care and mother's having poor education. Acquisition of PIV-2 was high in children with malnutrition, attaining day care and congenital heart diseases in both cohorts.

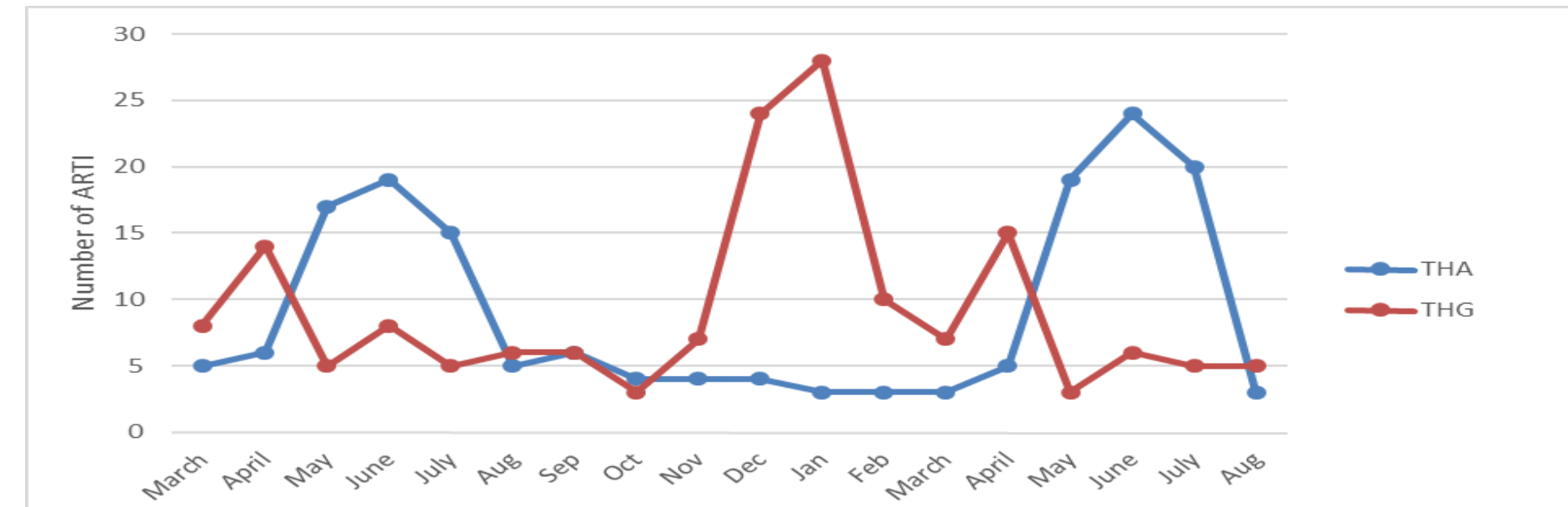


Figure 1. Total viral burden in THA and THG Cohorts for 18 months.

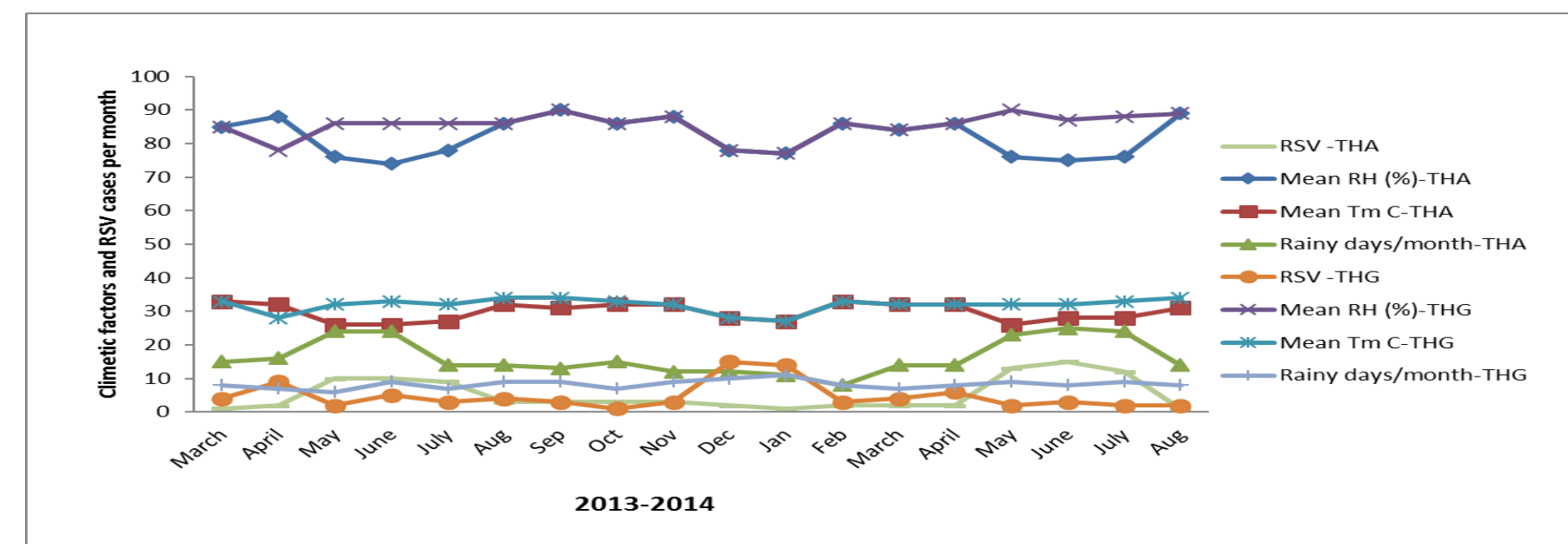


Figure 2. Distribution of RSV ARTI with rainfall, mean relative humidity and mean temperature in THA and THG Cohorts for 18 months.

Conclusion

- Overall, viruses tested account for > 40% of the ARTI in hospitalized children (330/861). RSV has been the commonly detected virus in children with ARTI in both study cohorts, contributing to the overall viral burden in a big way.
- Knowledge of seasonality of the occurrence of viruses causing ARTI children is important to implement early preventive measures. Identifying the viral causes using the virological diagnosis will reduce the empirical use of antibiotics. Knowledge of seasonality is important to implement early preventive measures, such as vaccination, use of respiratory precautions and health education.

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Funding

University Grants Commission, Sri Lanka (UGC/2012/JAAS Jayaweera) and University of Peradeniya, Sri Lanka for Dr F Noordeen (RG/AF/2013/38/M).