

BURDEN OF RESPIRATORY SYNCYTIAL VIRUS (RSV) AND OTHER LOWER RESPIRATORY TRACT VIRAL INFECTIONS DURING THE FIRST TWO YEARS OF LIFE: A PROSPECTIVE STUDY

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BACKGROUND AND AIM

- Lower respiratory tract infections (LRTIs) are a leading cause of pediatric morbidity and mortality worldwide, with ~650,000 deaths estimated in <5-year-olds in 2016¹
- Cross-sectional studies on hospitalized LRTIs are available, but longitudinal studies addressing the total burden of viral LRTIs are scarce
- This study (NCT01995175) prospectively collected incident RSV and other viral LRTIs in a multicountry cohort**

METHODS

Study design

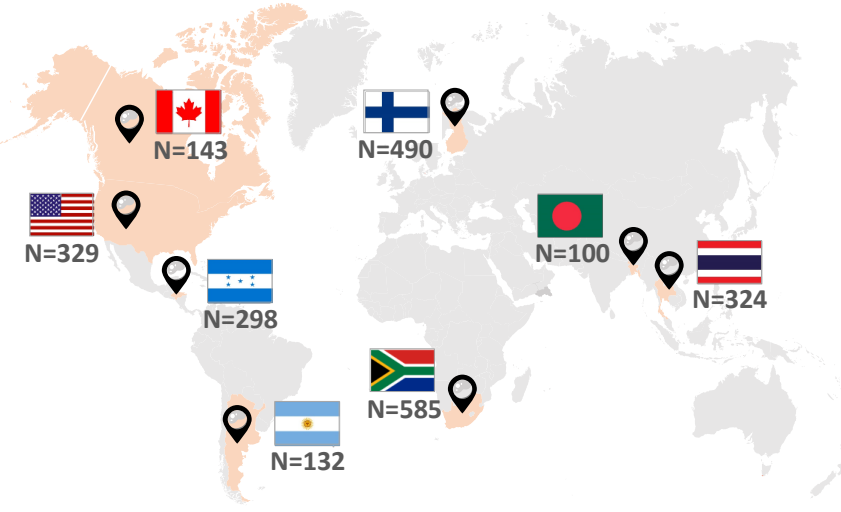
MULTICOUNTRY PROSPECTIVE COHORT STUDY FROM 2013 TO 2017

Inclusion criteria:

- ✓ informed consent obtained from parent before birth and within 5 days of birth
- ✓ ≥3 mL cord blood collection at birth

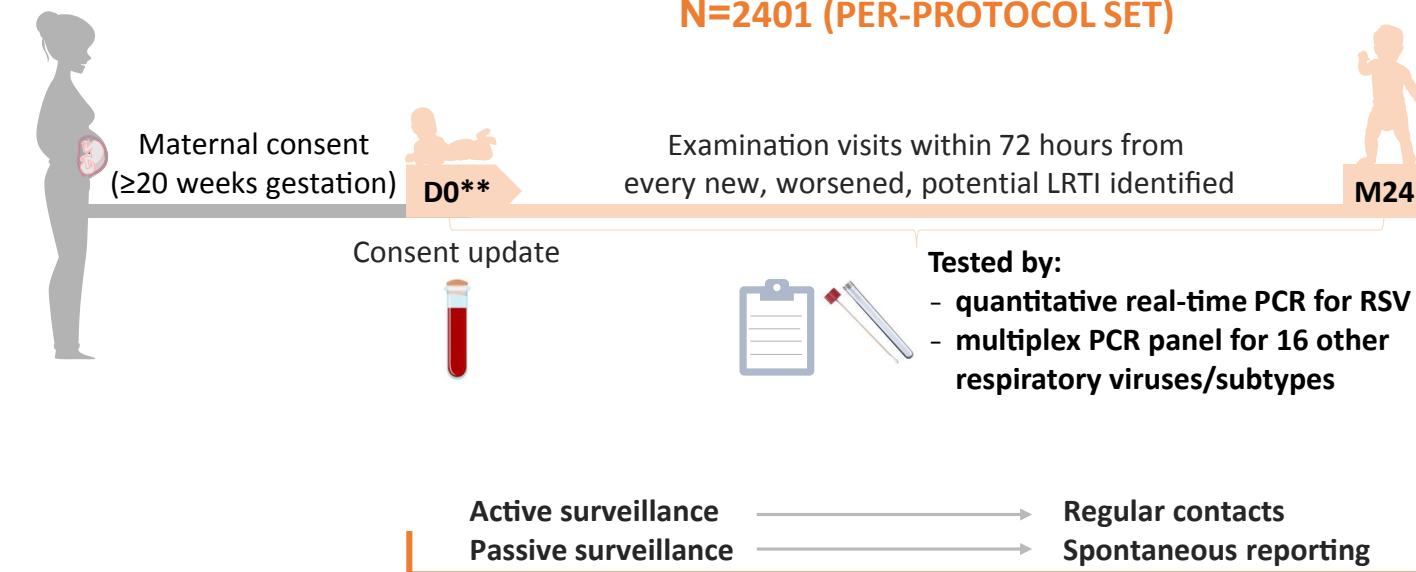
Exclusion criteria:

- * gestational age <28 weeks
- * parent <18 years old
- * immunodeficiency; other conditions*



STUDY PROCEDURES

N=2401 (PER-PROTOCOL SET)



🩸, cord blood sample; 📅, diary card; 🧻, nasopharyngeal swab; N, number of children; D, day; M, month; *limited life expectancy or postnatal hospitalization for >12 consecutive weeks foreseen; **enrollment. Note: bacterial culture not performed

2015 WHO-defined LRTI cases

2015 WHO-defined LRTI²

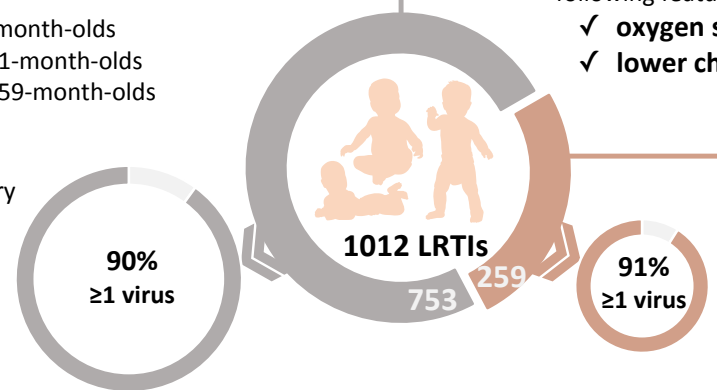
Child with cough and/or difficulty in breathing:

- ✓ **fast breathing:**
 - >60 per minute in <2-month-olds
 - >50 per minute in 2–11-month-olds
 - >40 per minute in 12–59-month-olds
- OR
- ✓ **oxygen saturation:**
 - <95% by pulse oximetry

2015 WHO-defined severe LRTI²

Child diagnosed with LRTI and ≥1 of the following features of severe disease:

- ✓ **oxygen saturation <93%** by pulse oximetry
- ✓ **lower chest wall in-drawing**

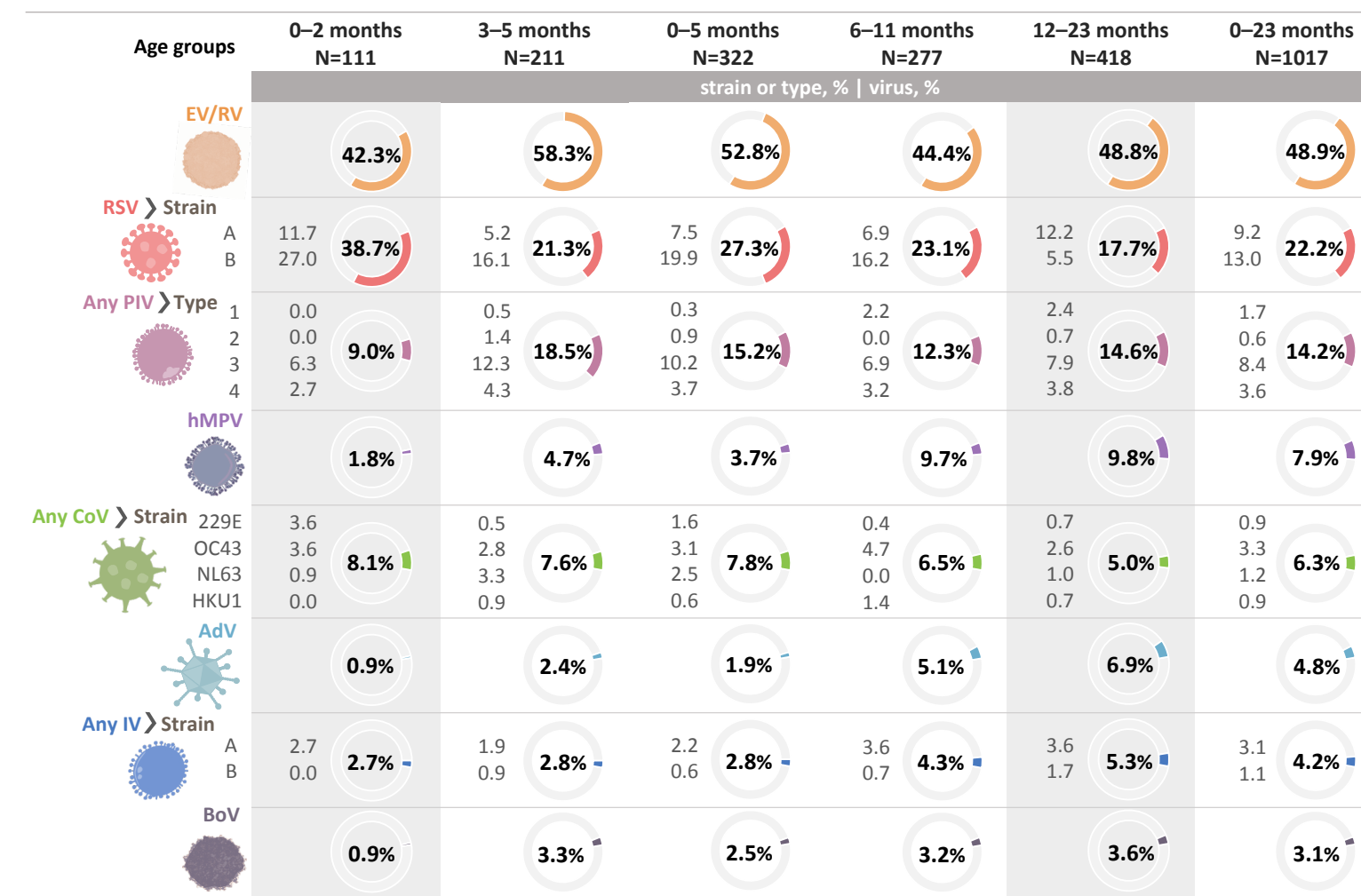


RESULTS

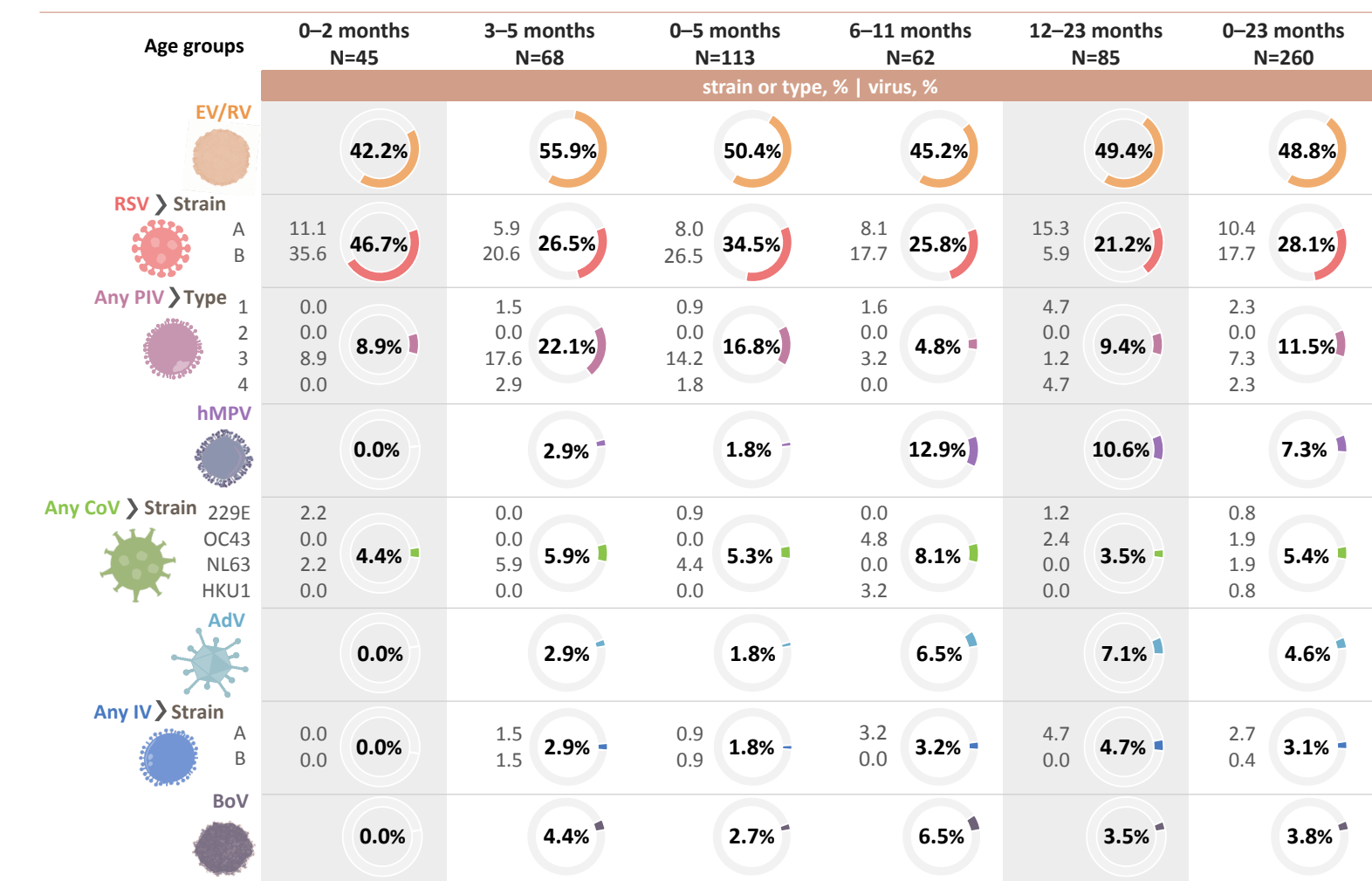
Enteroviruses/Rhinoviruses (EV/RV) were detected most frequently in samples from LRTI episodes, followed by RSV, parainfluenza viruses (PIV), human metapneumovirus (hMPV) and seasonal coronaviruses (CoV)

RSV was detected in 39% of samples from LRTI episodes in <3-month-olds and 18% in 1-year-olds

In a similar trend, RSV was detected in 47% of samples from severe LRTI episodes in <3-month-olds and 21% in 1-year-olds

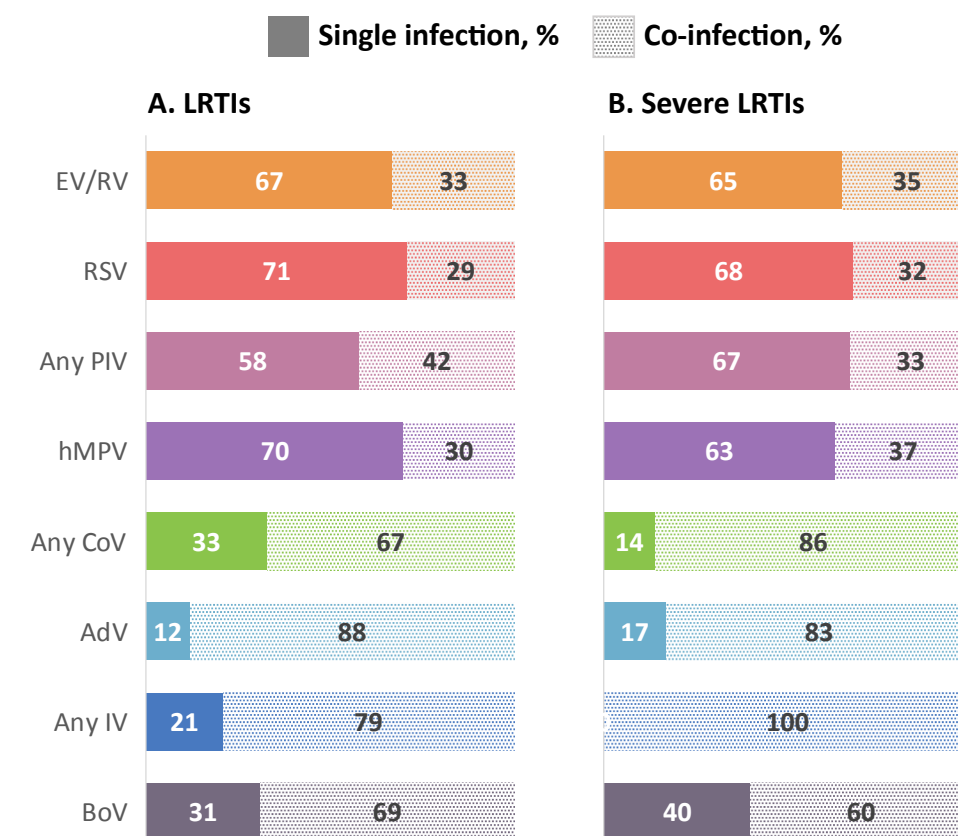


Per-protocol set. N, number of nasal swab samples collected in each age group; %, percentage of nasal swab samples positive for a given viral infection; AdV, adenovirus; IV, influenza virus; BoV, bocavirus



Single virus detections were more common in samples from LRTI episodes positive for RSV, hMPV, EV/RV and PIV, while co-detection with another virus was more often seen in AdV-, any IV-, BoV- and CoV-positive samples (panel A)

A similar trend was observed for severe LRTI episodes (panel B)



CONCLUSIONS

- Respiratory viruses are detected in the majority of LRTIs during the first two years of life. RSV likely accounts for much of this overall LRTI burden
- Our results contribute to filling the knowledge gap on total burden of viral LRTIs and suggest that RSV most frequently infected the very young; it was the most commonly detected virus in severe LRTIs in infants aged <3 months
- RSV was also detected in a high percentage of samples from LRTIs (22%) and severe LRTIs (28%) in children up to 2 years old

KEY MESSAGES



- Approximately 2/3 of LRTIs and 3/4 of severe LRTIs test positive for respiratory syncytial viruses (RSV) and/or enteroviruses/rhinoviruses
- Preventing RSV infection in infants and young children could substantially reduce the overall LRTI burden

References: 1. GBD 2016 Lower Respiratory Infections Collaborators, Lancet Infect Dis 2018;18:1191–210; 2. Modjarrad et al. Vaccine 2016;34:190–7

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