

# RSV Is Associated with a Higher Frequency of a Complex Hospital Course Than Influenza in Bronchiolitis

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## Background

- ▶ Bronchiolitis is a heterogeneous disease caused by a variety of viruses resulting in inflammation of the bronchioles—often requiring admission
- ▶ Respiratory syncytial virus (RSV) and influenza are viruses that can cause severe disease in young children
- ▶ No method exists for identifying children who will have severe disease that would necessitate admission

## Objective

- ▶ To compare the the frequency of a complex hospital course among influenza vs. RSV bronchiolitis admissions

## Methods

- ▶ **DESIGN:** retrospective cohort study
  - ▶ Inclusion criteria: admissions of children <2 years from 2016-2019 for bronchiolitis who were tested for RSV and influenza
  - ▶ Exclusion criteria: testing positive or negative for both influenza and RSV; children with complex chronic conditions
- ▶ **PRIMARY OUTCOME:** Complex Hospital Course:
  - ▶ Pediatric intensive care unit (PICU) admission
  - ▶ Respiratory support beyond low flow oxygen
  - ▶ Nutritional support via nasogastric tube feeds
  - ▶ Length of stay  $\geq$  75<sup>th</sup> percentile (110 hours)
  - ▶ Death
- ▶ **SECONDARY OUTCOMES:**
  - ▶ Time to event for respiratory support
  - ▶ 7 day readmission rates
- ▶ **ANALYSIS:**
  - ▶ Fisher's exact, chi-squared, student- t, and Mann-Whitney U tests
  - ▶ Unadjusted and adjusted logistic and truncated negative binomial regression models
  - ▶ Time to event with competing risks: Fine-Gray

## Results

Figure 1. Odds Ratios for complex hospital course

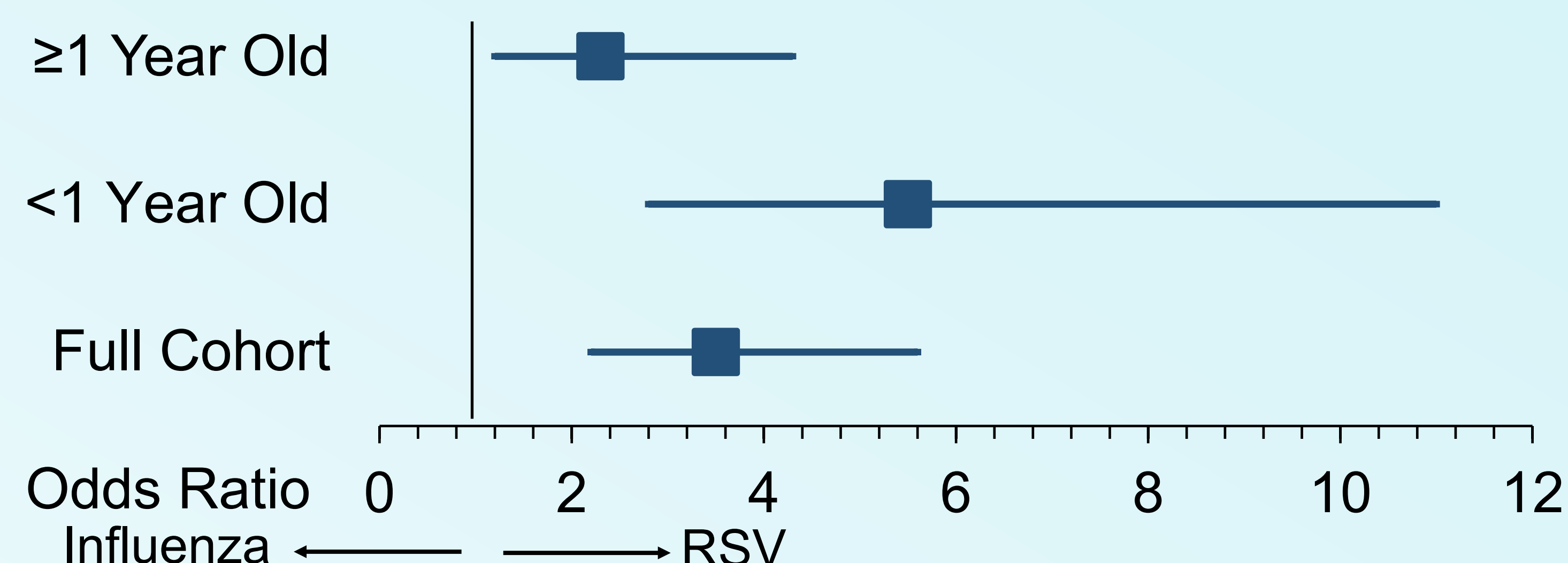


Table 1. Abnormal vital signs and medications given on admission

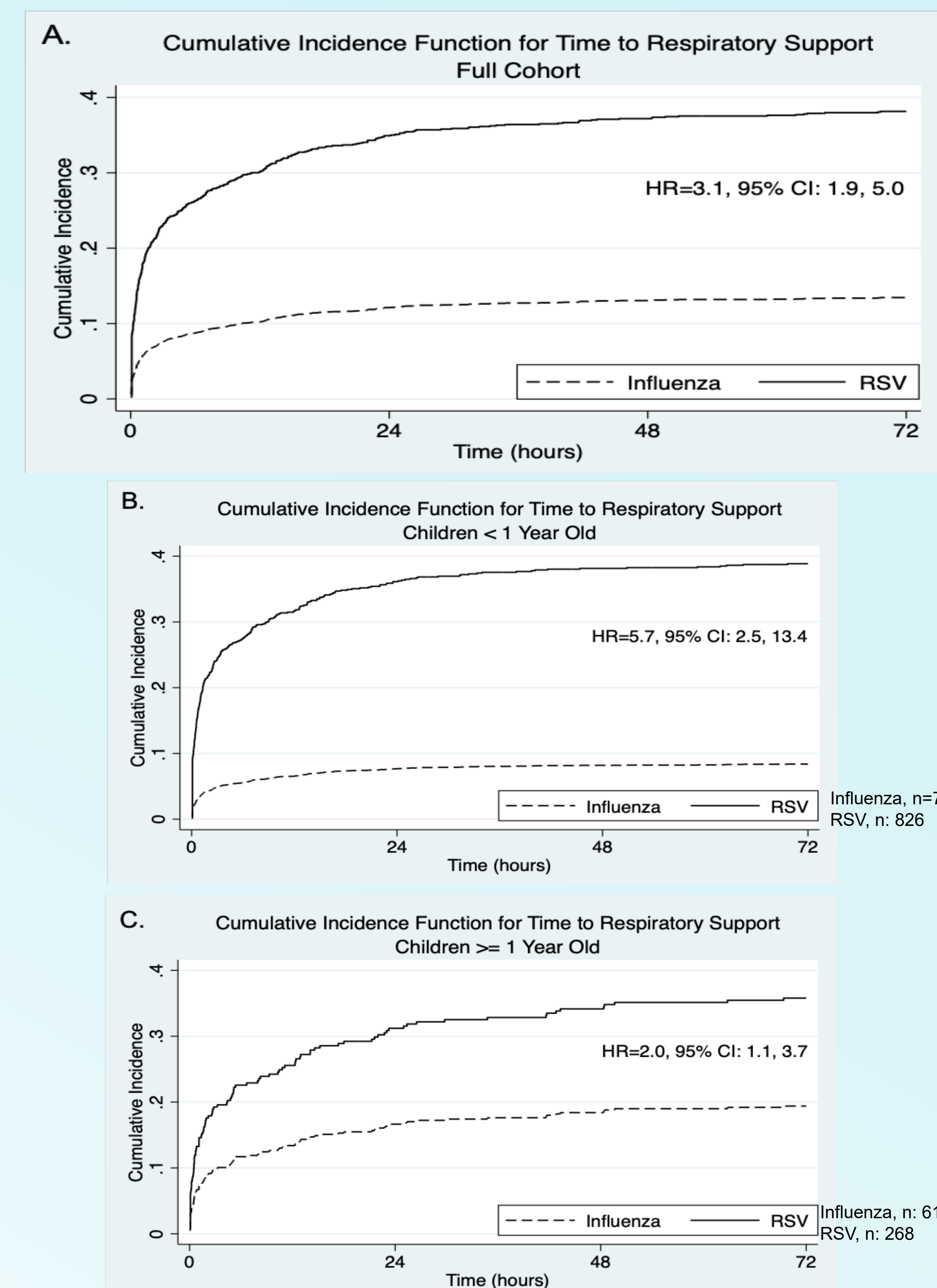
Admission vital signs/medication	Influenza (n=134)	RSV (n=1094)	P-value
Abnormal heartrate for age, n (%)	113 (84.3)	804 (73.5)	<0.01
Abnormal respiratory rate for age, n(%)	73 (54.5)	546 (49.9)	0.32
Oxygen saturation <92%, n (%)	2 (1.5)	40 (3.7)	0.31
Febrile on admission ( $\geq 38^{\circ}\text{C}$ ), n (%)	37 (27.6)	207 (18.9)	0.02
Albuterol, n (%)	20 (14.9)	324 (29.6)	<0.001
Antibiotic that treats pneumonia, n (%)	31 (23.1)	143 (13.1)	<0.01
Oseltamivir, n (%)	72 (53.7)	0 (0.0)	<0.001
Steroids, n (%)	13 (9.7)	135 (12.3)	0.38
Racemic epinephrine, n (%)	3 (2.2)	27 (2.5)	1.00

Table 2. Odds ratios for the components of a complex hospital course

Outcome	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
LOS $\geq 75^{\text{th}}$	2.5 (1.5, 4.2)	2.3 (1.3, 3.9)
Respiratory support	4.2 (2.5, 6.9)	4.1 (2.4, 6.9)
Nasogastric tube	2.5 (0.8, 8.2)	2.3 (0.7, 8.0)
PICU admission	2.5 (1.5, 4.3)	2.4 (1.4, 4.2)
Died	-	-

- ▶ Cohort: 1,094 (89%) with RSV and 134 (11%) with influenza
- ▶ RSV admissions were younger (165 days) than influenza (336 days,  $P < 0.001$ ) but not statistically different in sex, gestational age, race/ethnicity, insurance, or influenza vaccination if eligible.
- ▶ Median difference in LOS was 20 hours ( $P < 0.001$ ):
  - ▶ RSV median LOS: 67 (IQR: 39, 112)
  - ▶ Influenza median LOS: 47 (IQR: 27, 79)
- ▶ No difference in 7 day readmissions between groups

Figure 2. Time to respiratory support adjusted for competing risk of discharge



## Conclusions

- ▶ In bronchiolitis, RSV admissions are significantly more likely to experience a complex hospital course and have higher rates of respiratory support compared to influenza
- ▶ Viral etiology may be an important factor to consider when making decisions about admission

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