

Relationship between Neighborhood Census-tract Level Poverty and Respiratory Syncytial Virus (RSV)-associated Hospitalizations in U.S. Adults, 2015–2017



Jenna Holmen, MD, MPH¹; Lindsay Kim, MD, MPH^{2,3}; Bryanna Cikesh, MPH²; Pam Daily, MPH⁴; Gretchen Rothrock, MPH⁴ Shua J. Chai, MD, MPH^{4,5}; Nancy Bennett, MD, MS⁶; Maya Monroe, MPH⁷; Evan Anderson, MD^{8,9,10}; Erica Bye, MPH¹¹; Helen Keipp Talbot, MD, MPH¹²; Alison Muse, MPH¹³; Michael Whitaker, MPH²; Jennifer Ahern, PhD, MPH¹⁴; Chris Rowe, MPH^{14,15}; Gayle Langley²; Art Reingold, MD^{4,14}

¹UCSF Benioff Children's Hospital Oakland; ²Centers for Disease Control and Prevention (CDC); ³US Public Health Service; ⁴California Emerging Infections Program; ⁵Career Epidemiology Field Officer, CDC/CPR, DSLR; ⁶University of Rochester School of Medicine and Dentistry; ⁷Maryland Department of Health; ⁸Departments of Medicine and Pediatrics, Emory University School of Medicine; ⁹Georgia Emerging Infections Program; ¹⁰Atlanta Veterans Affairs Medical Center; ¹¹Minnesota Department of Health; ¹²Vanderbilt University Medical Center; ¹³New York State Department of Health; ¹⁴Division of Epidemiology, School of Public Health, University of California, Berkeley; ¹⁵San Francisco Department of Public Health

Contact information: Jenna Holmen, MD, MPH UCSF Benioff Children's Hospital Oakland, 747 52nd St., Oakland, CA 94609. Tel: (510)428-3336. Email: jenna.holmen@ucsf.edu

Introduction

- In the U.S., RSV is increasingly recognized as a cause of hospitalization for adults with respiratory illness.^{1,2}
- In the U.S., RSV accounts for up to 12% of medically-attended illness acute respiratory illness in adults.
- RSV has a case fatality proportion of 6-8% in adults >50 years of age.^{1,3}
- Socioeconomic status can have an important influence on a person's health and has not been well-studied in the context of adults with RSV.^{4,5,6,7}
- While studies evaluating the incidence of influenza by neighborhood-level socioeconomic have shown a consistently higher incidence of influenza with increasing levels of neighborhood poverty, there are no such studies among adults with RSV.^{8,9}

Objectives

- Calculate the incidence of RSV-associated hospitalizations in adults by census-tract (CT) level poverty using the RSV-Associated Hospitalization Surveillance Network (RSV-NET), a population-based surveillance system that collects data on laboratory-confirmed RSV-associated hospitalizations in all ages in 12 U.S. sites.

Methods

- Laboratory-confirmed adult RSV cases from the 2015–2017 respiratory viral seasons (October 1–April 30) were identified using hospital and state public health laboratory databases and reported to participating Emerging Infections Program sites.
- Medical charts were reviewed for demographic and clinical data, including patient addresses that were then geocoded to their corresponding census-tract.
- Census tracts were divided into four levels of poverty based on American Community Survey data using percentage of people living below the poverty level: 0–4.9%, 5–9.9%, 10–19.9%, and ≥20%.
- Incidence rates were calculated using population data from the 2010 US census and standardized for age.

Results

	Percent of individuals living below the poverty level within a census tract				Total (n=1713)
	0-4.9% (n=397)	5-9.9% (n=535)	10-19.9% (n=438)	≥20% (n=343)	
Age (years)					
18-49	49 (12)	59 (11)	70 (16)	73 (21)	251 (15)
50-64	76 (19)	132 (25)	109 (25)	115 (34)	432 (25)
65-79	137 (35)	167 (31)	123 (28)	112 (33)	539 (31)
≥80	135 (34)	177 (33)	136 (31)	43 (13)	491 (29)
Sex					
Male	180 (45)	196 (37)	183 (42)	141 (41)	700 (41)
Female	217 (55)	339 (63)	255 (58)	202 (59)	1013 (59)
Race/Ethnicity					
White	306 (77)	358 (67)	247 (56)	123 (36)	1034 (60)
Black	34 (9)	78 (15)	116 (26)	171 (50)	399 (23)
Asian/Pacific Islander	33 (8)	58 (11)	38 (9)	13 (4)	142 (8)
Other/not-reported	4 (1)	5 (1)	3 (1)	3 (1)	15 (1)
Hispanic	15 (4)	31 (6)	25 (6)	30 (9)	101 (6)
Insurance type*					
Medicare	234 (59)	321 (60)	248 (57)	176 (51)	979 (57)
Medicaid	48 (12)	81 (15)	95 (22)	153 (45)	377 (22)
Private insurance	229 (58)	248 (46)	188 (43)	115 (34)	780 (46)
Uninsured	5 (1)	2 (0)	10 (2)	5 (1)	22 (1)
Other/not-reported	11 (3)	8 (1)	9 (2)	5 (1)	33 (2)
State					
California	123 (31)	199 (37)	143 (33)	57 (17)	522 (30)
Georgia	36 (9)	39 (7)	66 (15)	45 (13)	186 (11)
Maryland	94 (24)	100 (19)	86 (20)	61 (18)	341 (20)
Minnesota	43 (11)	45 (8)	28 (6)	21 (6)	137 (8)
New York	89 (22)	101 (19)	81 (18)	124 (36)	395 (23)
Tennessee	12 (3)	51 (10)	34 (8)	35 (10)	132 (8)

Table 1. Demographic characteristics of adults with an RSV-associated hospitalization, 2015–2017.

*Multiple patients had >1 insurance type.

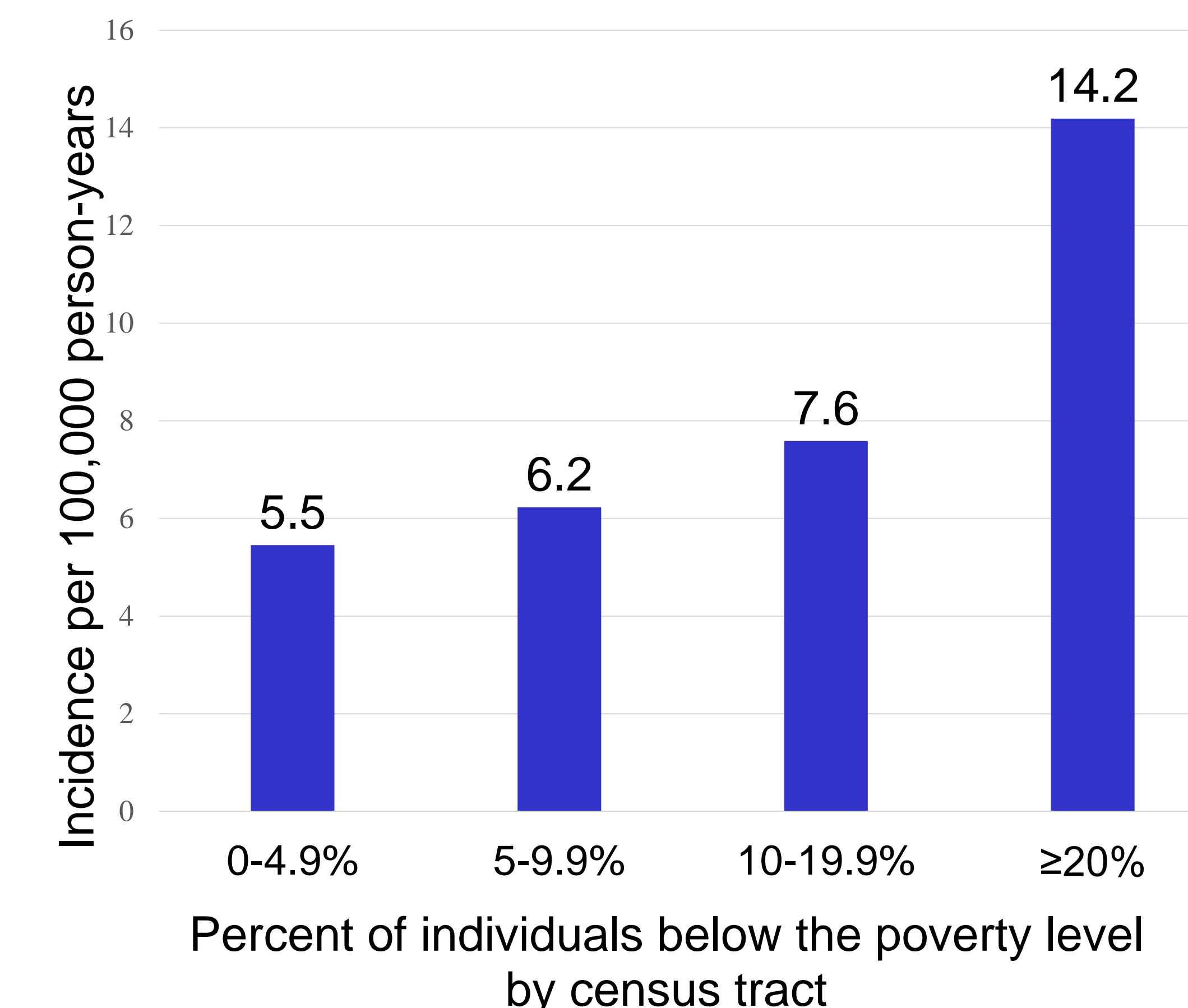


Figure 1. Age-adjusted incidence rate of RSV-associated hospitalizations of adults by census-tract poverty level, 2015–2017.

Poverty levels (all sites)	Relative Risk	95% Confidence Interval
0-4.9%	---	---
5-9.9%	1.12	0.98, 1.28
10-19.9%	1.38	1.20, 1.58
≥20%	2.58	2.23, 2.98

Table 2. Incidence rate ratios for RSV-associated hospitalizations of adults by census-tract poverty level, 2015–2017.

Limitations

- This study included only hospitalized adults; therefore it is not reflective of the overall burden of RSV disease.
- Identification of cases is dependent on testing and only a limited number of patients receive RSV testing, even among the hospitalized patients
- There are potential biases in both the hospital admission process and on the decision of who to test.

Summary and Conclusions

- Among the 1713 RSV case-patients with demographic characteristics (Table 1), 60% were >65 years.
- Almost 77% of cases lived in census tracts with intermediate and high levels of poverty (i.e., neighborhoods with >5% of residents living below the poverty line).
- Increasing incidence of RSV associated-hospitalizations with increasing CT-level poverty was seen.
- The risk of RSV-associated hospitalization was 2.58 times higher in census tracts with the highest (20%) versus the lowest (<5%) percentages of individuals living below the poverty level.
- CT-level poverty might be an important contributor to RSV-associated hospitalization in adults.

Future Directions

- Will use regression analysis to evaluate whether there is an association between more severe RSV disease and neighborhood poverty level.
- Perform a similar analysis in the pediatric population.

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