RSV Disease: Adults

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GSK

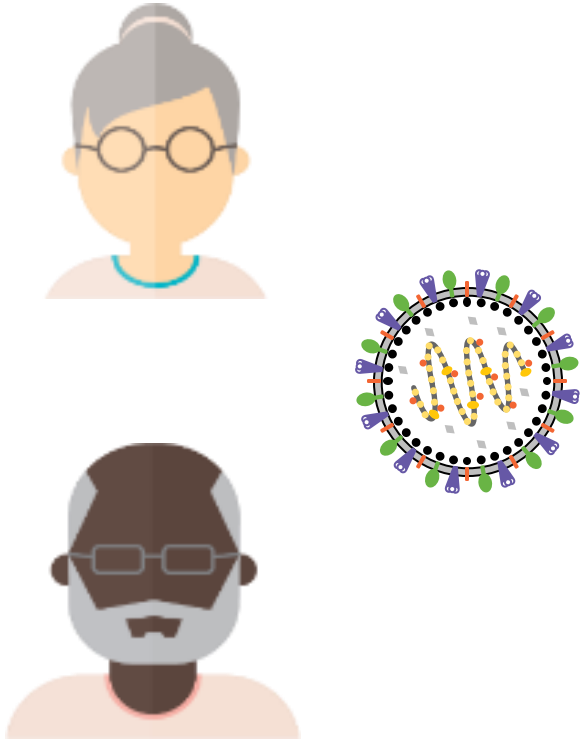
This presentation is provided in response to the request from the organizers of NFWL, Healthcare Summit

This response was developed according to the principles of evidence-based medicine and, therefore, references may not be all-inclusive.

Disclosure: Iriny Mary Salib is employed by GSK where she is a vaccine research scientist and educator.

RSV is a common cause of acute respiratory illness[1]

- In adults, RSV infection typically results in mild, cold-like symptoms, but may cause hospitalization and death, particularly in vulnerable adults[2]
- Immunity after natural infection wanes, and re-infection occurs throughout life[3,4]
- RSV symptoms are like those of other respiratory infections; differential diagnosis requires laboratory confirmation[5,6]
- Every year, RSV cases in adults result in a substantial clinical and economic burden in the US[2,7,8]
- No specific treatments for RSV are available for adults[9]

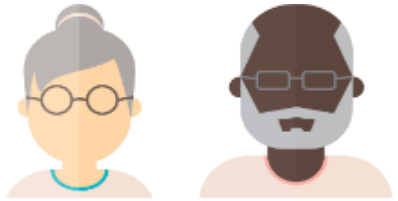


RSV = respiratory syncytial virus.

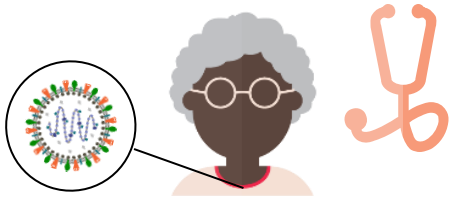
1. Walsh EE. *Clin Chest Med* 2017;38:29–36. 2. CDC, 2020. RSV in older adults and adults with chronic medical conditions. https://www.cdc.gov/rsv/high-risk/older-adults.html Accessed August 2022. 3. Graham BS. *Immunol Rev* 2011;239:149–166. 4. Anderson LJ *et al. Vaccine* 2013;31S:B209–B215. 5. Kodama F et al. *Infect Dis Clin North Am* 2017;31:767–790. 6. CDC RSV for healthcare professionals. https://www.cdc.gov/rsv/clinical/index.html Accessed April 2022. 7. Amand C et al. *BMC Health Serv Res. 2018*:18:294. 8. Falsey AR et al. *N Engl J Med* 2005;352:1749–1759. 9. Centers for Disease Control and Prevention. Symptoms and Care of RSV (Respiratory Syncytial Virus) | CDC. Accessed September 2022.

RSV is associated with clinical burden in older adults in the US[1]

Estimated annual burden of RSV infection among adults aged ≥ 65 years in the US:[1]

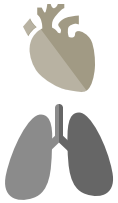


3-7% of older adults develop RSV infection in a typical year[1]



Hospitalization for RSV infection ~177,000 hospitalizations[1]

Death due to RSV infection Estimated 14,000 deaths[1a]



The burden of RSV hospitalization is particularly high among older adults and those with underlying cardiopulmonary conditions and diabetes[2,3]

Hospitalization of older adults[b] for RSV typically lasts 3–6 days[4]

Among hospitalized older adults[b] with RSV, 10–31% are admitted to the ICU[4]

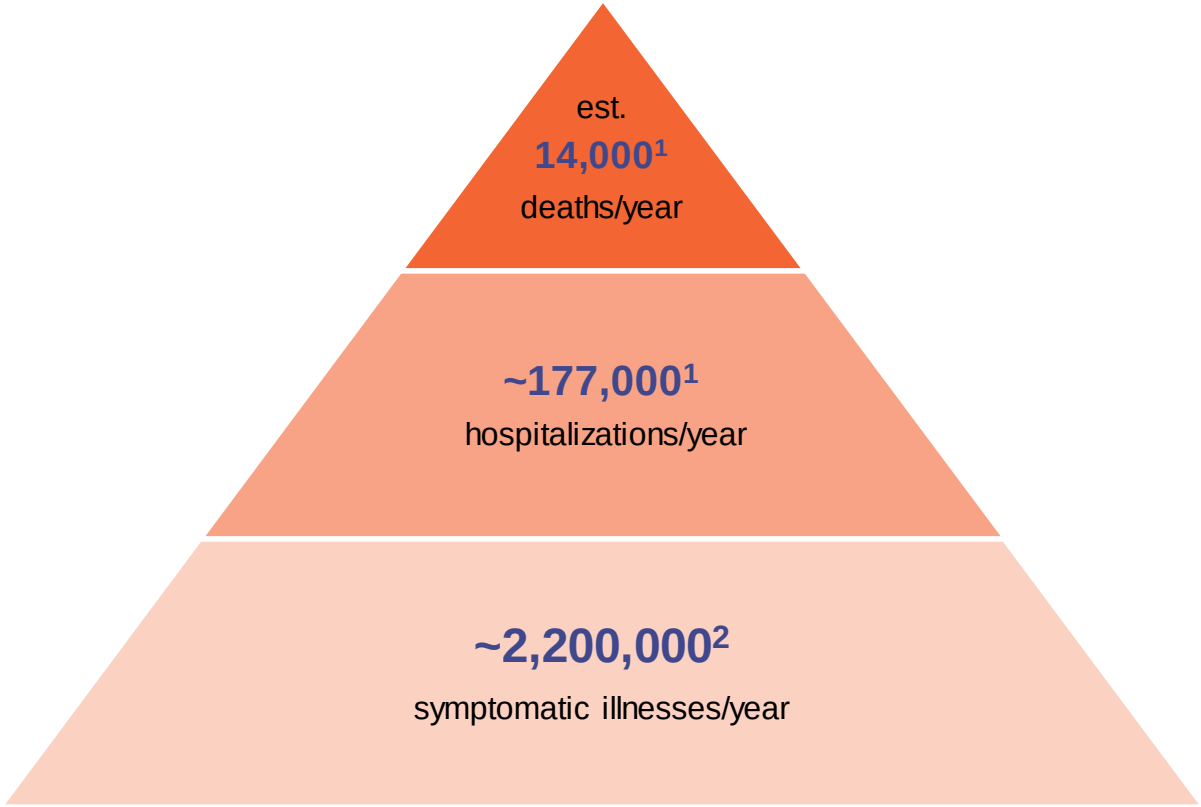
In-hospital case fatality rate of 8% for older adults[a] with RSV[1]

[a] Based on 8% death rate for hospitalized patients ≥ 65 YOA with RSV infection[1]; [b] Median and average ages ≥ 60 YOA.

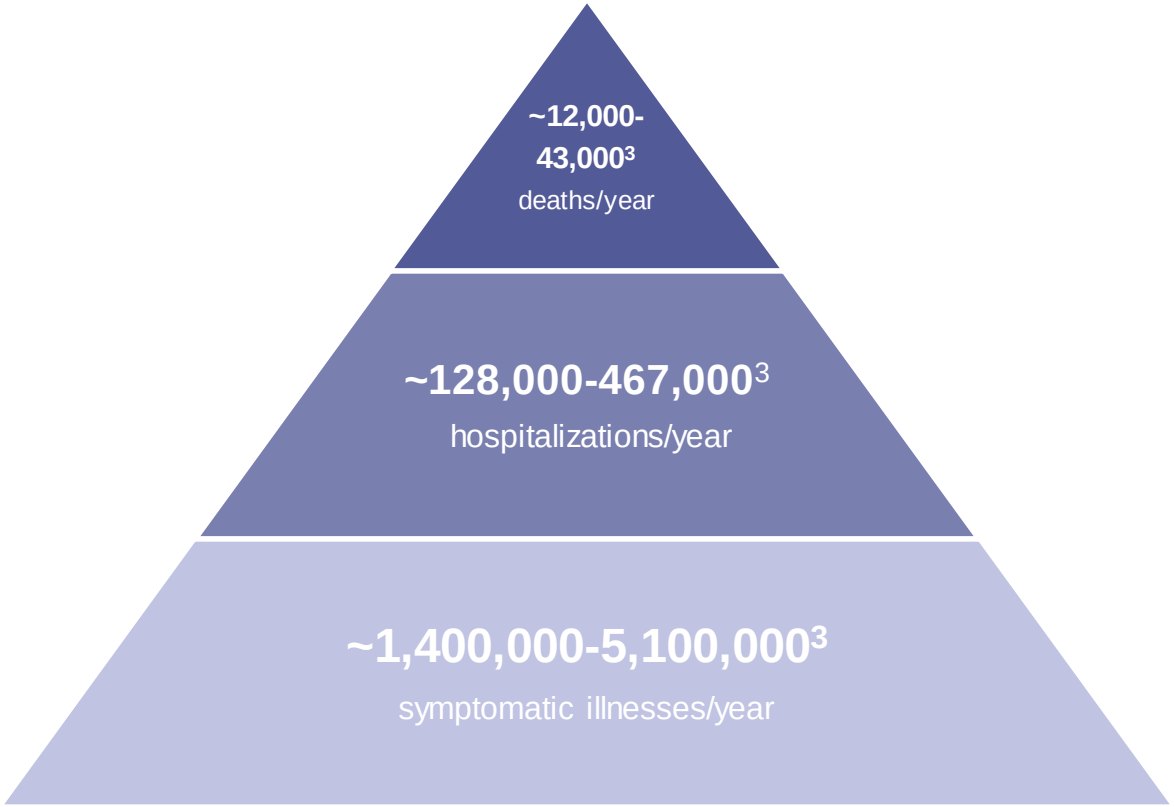
ICU = intensive care unit

1. Falsey AR, et al. N Engl J Med. 2005;352:1749–1759. https://doi.org/10.1056/nejmoa043951. 2. Branche AR et al. Clin Infect Dis. 2022 Mar 23;74(6):1004-1011. https://doi.org/10.1093/cid/ciab595. 3. Belongia EA, et al. Open Forum Infect Dis. 2018;27;5:ofy316. https://doi.org/10.1093/ofid/ofy316. 4. Colosia AD, et al. *PLoS One.* 2017;12:e0182321. https://doi.org/10.1371/journal.pone.0182321.

RSV and influenza burden of disease among adults ≥ 65 years of age in the US



RSV



Influenza

est. = estimated.

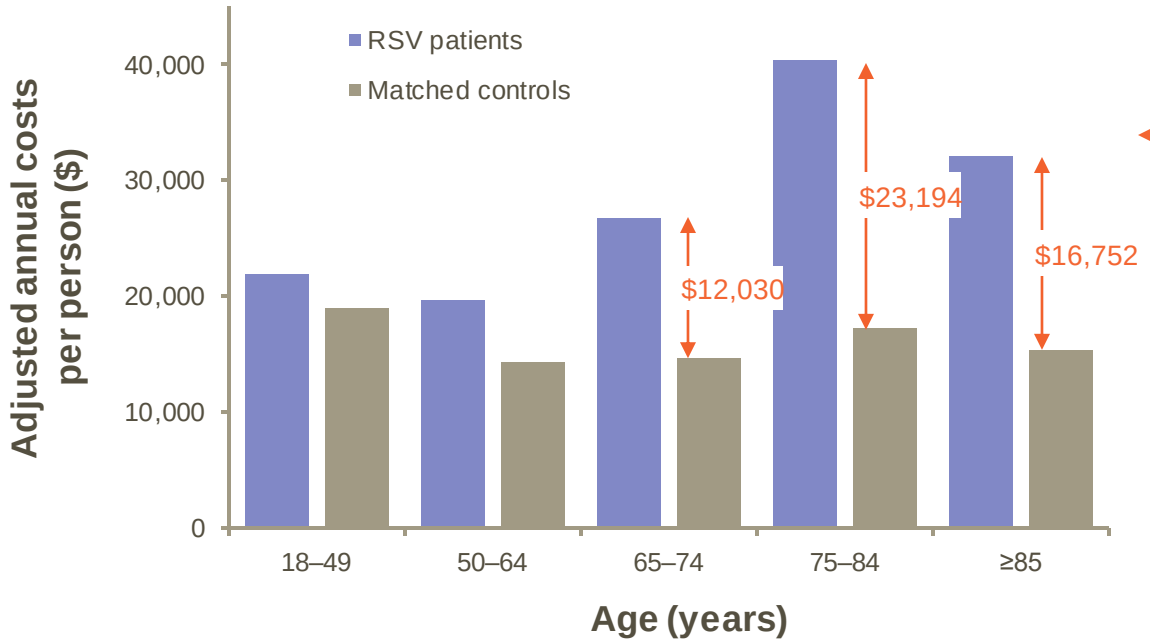
1. Falsey AR, et al. *N Engl J Med.* 2005;352:1749–1759. https://doi.org/10.1056/nejmoa043951. 2. Centers for Disease Control and Prevention. https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2022-06-22-23/04-RSV-Havers-508.pdf. Accessed September 2022. 3. Centers for Disease Control and Prevention. Past Seasons Estimated Influenza Disease Burden | CDC. Accessed September 2022.

Estimates indicate a high economic burden of RSV in older adults in the US

A retrospective case–control database analysis quantified RSV-related healthcare resource use and costs by age group[1]

N = 11,432 RSV patients aged > 1 year were matched 1:1 with non-RSV controls, matched for age, sex, region and health plan; 2012–2013[a]

Annual healthcare costs for adults with RSV vs matched controls



RSV patients had higher healthcare resource use than controls for all age groups[1]

Older adults aged ≥ 65 years showed the greatest difference in costs incurred between RSV and non-RSV groups[1]

A prospective surveillance study among older and high-risk adults (N = 2536) estimated the annual cost of RSV hospitalization in the USA

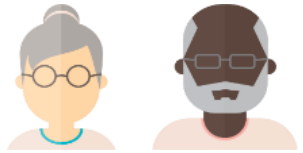
exceeds $1 billion[2]

The same results were first published by Amand C *et al.* 2018. The graph was independently created for GSK from the original data.

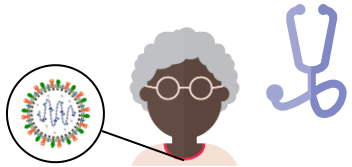
[a] August, 31 2012 – August 1, 2013.

1. Amand C et al. *BMC Health Serv Res.* 2018;18:294. https://doi.org/10.1186/s12913-018-3066-1. 2. Falsey AR, et al. N Engl J Med. 2005;352:1749–1759. https://doi.org/10.1056/nejmoa043951.

Racial and ethnic disparities in respiratory infection diagnoses and severe outcomes have been reported



Among adults with risk factors for severe RSV, being of **racial and ethnic minority** status, having **exposure to children**, and being insured with **Medicaid or Medicare** are associated with an increased risk of **symptomatic RSV and acute respiratory illness**[1,2]



Adults of **racial and ethnic minority** status and insured with **Medicaid or uninsured** have higher rates of **emergency department admission** for upper respiratory infections and acute respiratory illness[3,4]

American Indian/Alaska Native adults experience substantially higher rates of **hospitalization and death** from lower respiratory tract infections than people of other races and ethnicities[5,6]

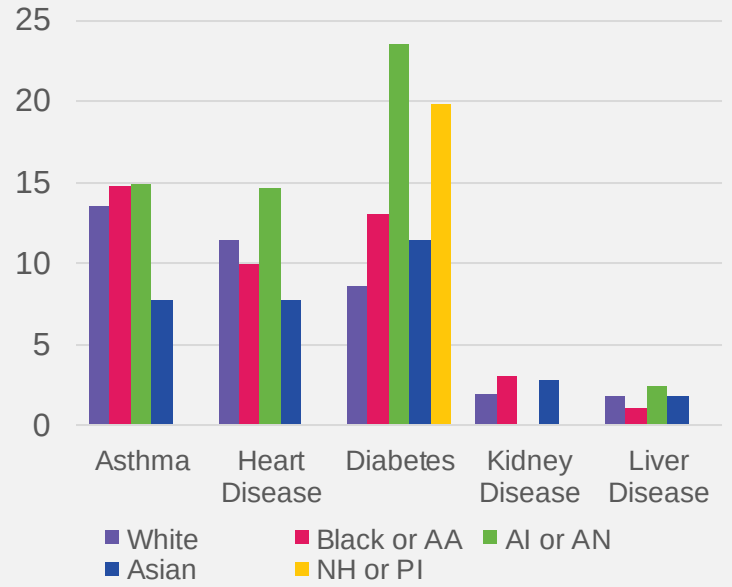
1. Mehta et al., 2013; 2. Zou et al., 2018; 3. May et al., 2013; 4. Mellis et al., 2021; 5. Cheek et al., 2014; 6. Gounder et al., 2017.

Chronic conditions that are risk factors for severe RSV-related outcomes are more common among certain racial and ethnic minority groups

Many previous studies have found that racial and ethnic minority groups are more likely to develop chronic conditions that are risk factors for severe RSV-related outcomes:

Chronic pulmonary conditions	Asthma and COPD are associated with being Black/AA, being AI/AN, lower neighborhood-level SES, and higher poverty levels[1-3]
Chronic cardiac conditions	Black/AA individuals have disproportionately high prevalence of cardiovascular diseases, including heart failure[4,5]
Diabetes	Racial and ethnic minority groups and adults with lower SES are more likely to have diabetes than White adults or adults with higher SES[4,6-8]
Chronic kidney disease	ESRD prevalence is highest among individuals of racial and ethnic minority status, lower SES, and in areas with worse Social Deprivation Index scores[4,9,10]
Chronic liver disease	Hispanic individuals, as well as adults living in food insecure households, have the highest prevalence of NAFLD[11-13]

NHIS data also demonstrate disparities in age-adjusted percentages of adults aged ≥18 years with chronic conditions (2018)[14]



Note: Analysis among adults who indicated only a single race group, including those of Hispanic or Latino origin.

AA = African American; AI/AN = American Indian/Alaska Native; COPD = chronic obstructive pulmonary disease; ESRD = end stage renal disease; NAFLD = non-alcoholic fatty liver disease; NHIS = National Health Interview Survey; NH/PI = Native Hawaiian/Pacific Islander; SES = socioeconomic status.

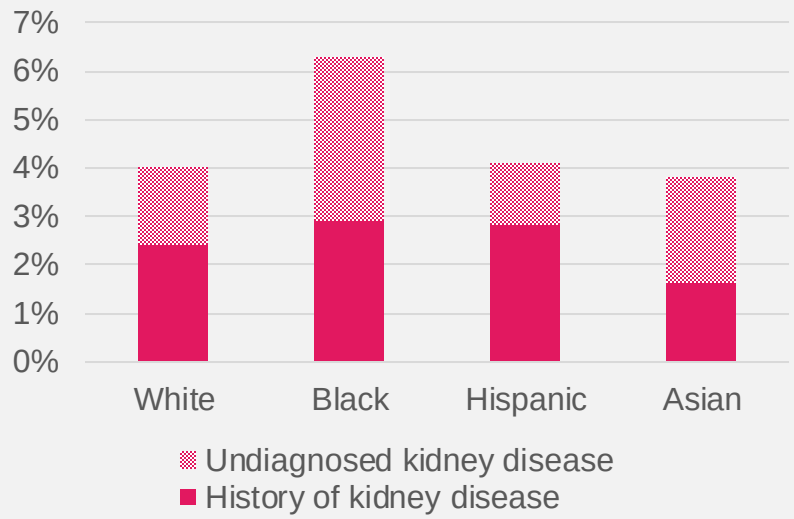
1. CDC, 2022a; 2. Bhan et al., 2015; 3. Ejike et al., 2021; 4. Tsao et al., 2022; 5. Lewsey and Breathett, 2021; 6. CDC, 2022b; 7. Cheng et al., 2019; 8. Hill-Briggs et al., 2020; 9. USRDS, 2022; 10. Vart et al., 2020; 11. Rich et al., 2018; 12. Kim et al., 2019; 13. Golovaty et al., 2020; 14. CDC, 2019.

Risk factors for severe RSV-related outcomes are more likely to be undiagnosed in certain racial and ethnic minority groups

The extent to which **racial and ethnic minority** groups have **RSV risk factors** is likely **underestimated** given **disparities in health care access**, particularly in younger ages prior to Medicare eligibility[1,2]

- Racial and ethnic minority groups have **increased odds** of being **undiagnosed with obstructive lung disease**[3]
- Hispanic, Black, and Asian adults have a **significantly higher prevalence** of **undiagnosed diabetes**, as well as a **significantly higher proportion** of undiagnosed diabetes among total diabetes prevalence[4-6]
- Black adults are approximately **twice as likely** to have **undiagnosed kidney disease** compared to White adults[6]
- Asian adults are **more likely** to have **undiagnosed hypertension**, with a **significantly higher proportion** of Asian, Black, and Hispanic adults unaware of their hypertension versus White adults[6,7]

Total kidney disease prevalence among adults ≥18 years accounting for undiagnosed disease: NHANES 2011-2014[6]



NHANES = National Health and Nutrition Examination Survey.

1. Mahajan et al., 2021; 2. Wallace et al., 2021; 3. Martinez et al., 2015; 4. Cheng et al., 2019; 5. Tsao et al., 2022; 6. Kim et al., 2018; 7. Huang et al., 2022.

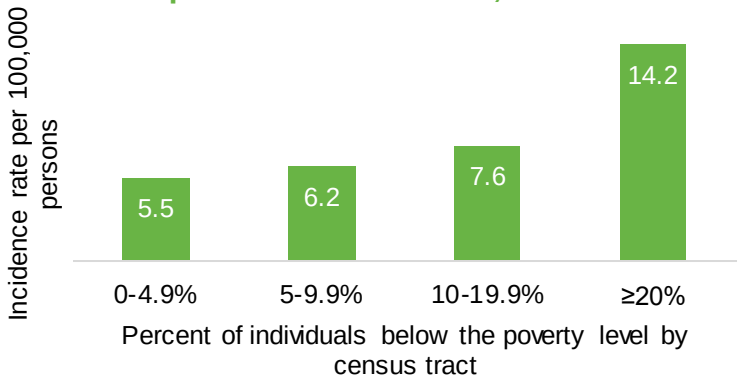
In addition to race and ethnicity, disparities in severe RSV and respiratory infection outcomes have also been observed by other Social Determinants of Health

The incidence rate of RSV-associated hospitalization in adults is **2.58 times higher** in census tracks with the highest versus the lowest percentages of individuals living below the **poverty level** and **1.52 times higher** in census tracks with the highest versus the lowest levels of **crowding**[1]

Households reporting **subjective social status** below the median have a **46% higher** incidence of ARI compared with households above the median, while households with **children aged <5 years** have a **47-56% higher incidence** of ARI compared to households with no children aged <5 years[2]

The estimated annual **hospitalization** incidence for RSV infections among adults in the ZIP codes from the **lowest** tertile for **socioeconomic status** is approximately **double** that of adults in the highest socioeconomic status ZIP codes[3]

Incidence rate of RSV-associated hospitalizations in adults, 2015-2017[1]



Adults who are **homeless** or **drug users** have been found to be at an **increased odds** of hospitalization for RSV as compared to influenza[4]

Estimated annual RSV-attributable respiratory hospitalization rates, July 2005-June 2014[3]

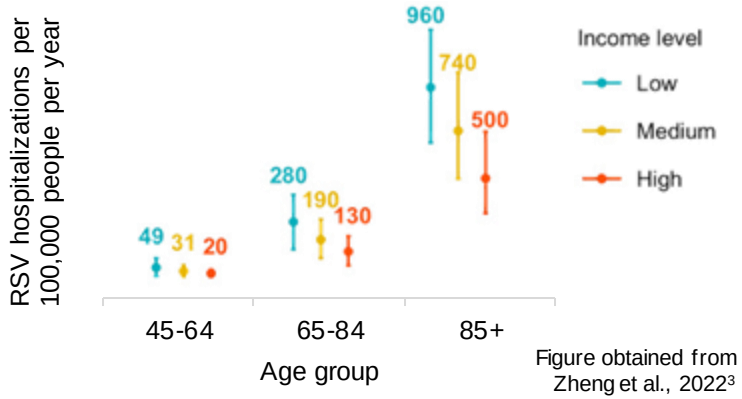


Figure obtained from Zheng et al., 2022[3]

ARI = acute respiratory infection

1. Holmen et al., 2021; 2. Malosh et al., 2019; 3. Zheng et al., 2022; 4. Boonyaratanakornkit et al., 2019.

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State legislators can raise awareness of RSV in adults

Partner with existing community-based programs	• These groups can help educate and share information on the importance of RSV and other adult recommended vaccines your constituents may need or may have recently missed.
Community-based vaccine education and outreach initiatives	• Designed and shared by trusted individuals are effective approached to increase uptake of adult recommended vaccines.
Access	• While general awareness and prevention should be a top priority. It's also critical that everyone has access to vaccinations where they get their care.
Pharmacy	• Many adults find it easier to get their vaccines at their pharmacy due to proximity and convenience. Increasing the number of vaccinators will reduce many barriers to access. • States add Pharmacy Technicians to the list of those trained to administer licensed RSV and other ACIP recommended vaccines. • Pharmacy administered vaccines can improve access and convenience, especially in low-income and rural communities.