Disparities in Respiratory Syncytial Virus (RSV) Diagnosis, Outcomes, and Risk Factors by Race, Ethnicity, and Other Social Determinants of Health: A Systematic Literature Review

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INTRODUCTION

- **RSV causes substantial disease burden** among older adults (aged ≥60 years) and those at increased risk of severe outcomes.[1]
- **The disproportionate impact of ARI** due to influenza and COVID-19 on racial and ethnic minorities and other disadvantaged groups in the US **has been well documented.**[2,3]
- **Among adults**, less is known about **RSV-related disparities.**

This study reviews evidence on disparities in **RSV diagnosis**, **RSV-related outcomes**, and **RSV risk factors** among US adults by race, ethnicity, and other SDOH.

METHODS

Study design: SLR of RSV-related disparities by race, ethnicity, and other SDOH among US adults.

Search strategy:
- Systematic searches of databases (MEDLINE, Embase, and Cochrane)
- Desktop searches (e.g. SLR bibliographies, gray literature)
- Articles published between **2012 - 2022.***

Screening: According to predefined **PICOTS inclusion criteria** by 2 independent researchers (see supplementary material).

Key recent articles on disparities in RSV risk factors were prioritized for inclusion.†

*Given the limited number of studies on RSV-related disparities and because RSV is often not accurately identified as the causative pathogen of an ARI due to undertesting/underdiagnosis, inclusion criteria were expanded to encompass disparities in general ARI.
†Due to the large number of studies published on disparities in chronic cardiopulmonary and endocrine/metabolic conditions.

RESULTS

For disparities in RSV/ARI **diagnosis** and **outcomes**: **701** articles screened at title/abstract level ▶ **58** full texts evaluated for inclusion ▶ **15** studies met PICOTS eligibility criteria*

*see supplementary material

DISPARITIES IN RSV/ARI DIAGNOSIS

4 studies reported on **disparities in RSV/ARI diagnosis in adults by race, ethnicity, and other SDOH.**

Several factors were associated with an increased risk of symptomatic RSV/ARI among adults with risk factors for severe RSV, including:[4,5] ▶

- being of **racial and ethnic minority status**
- having **exposure to children**
- being insured with **Medicaid or Medicare**

SSS[6,7]

Households reporting **below-median SSS** (a measure of socioeconomic position) have a **46% higher ARI incidence*** vs. households reporting above-median SSS.[6]

*95% CI 1.05-2.03

DISPARITIES IN RSV- AND ARI-RELATED OUTCOMES

11 studies reported **disparities in RSV- and ARI-related outcomes, including hospitalization, ED visit, and death rates.**

Disparities among AI/ANs[8-11]

Among older **AI/AN adults**, LRTI **hospitalization and mortality rates** are **5.6 and 1.8 times higher***, respectively, vs. adults of other races and ethnicities.[9,10]

*Adults ≥50 years; hospitalization rate 95% CI 5.1-6.1[9]; mortality rate 95% CI 1.7-1.9[10]

Disparities in Hospitalization Rates[12-14]

Incidence rate of RSV-associated **hospitalization** in adults is **2.58 times higher*** in the highest vs. the lowest **poverty level census-tracks.**[13]

*95% CI 2.23-2.98

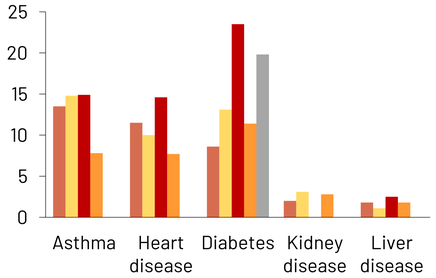
Disparities in ED Visits[15,16]

Black persons have **2.5 times higher** rates of ARI **ED visits*** vs. non-Hispanic White persons.[16]

*95% CI 1.9-3.2

DISPARITIES IN RSV RISK FACTORS

Age-adjusted percentages of adults aged ≥18 years with chronic conditions[17]



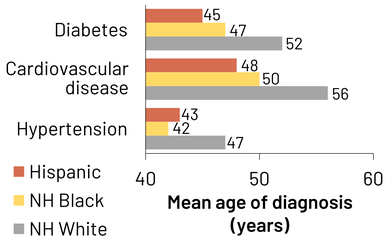
Chronic medical conditions that are risk factors for severe RSV-related outcomes are more **prevalent**, develop at **younger ages**, and are more likely to be **underdiagnosed** among disadvantaged groups.

- **Chronic pulmonary conditions:** Asthma and COPD are associated with being Black/AA, being AI/AN, lower neighborhood-level SES, and higher poverty levels.[18-20]
- **Chronic cardiac conditions:** Black/AA individuals have disproportionately high prevalence of cardiovascular diseases, including heart failure.[21,22]
- **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.[22-25]
- **Chronic kidney disease:** ESRD prevalence is highest among individuals of racial and ethnic minority status, lower SES, and in areas with worse SDI scores.[22,26,27]
- **Chronic liver disease:** Hispanic individuals, as well as adults living in food insecure households, have the highest prevalence of non-alcoholic fatty liver disease.[28-30]

Racial and ethnic minority groups have significantly higher prevalence of undiagnosed: obstructive lung disease,[31] diabetes,[22,24,32] kidney disease,[32] and hypertension.[32,33]

Mean age of diagnosis in non-Hispanic Black and Hispanic adults vs. non-Hispanic White adults: [33-35]

- Diabetes: 4-7 years earlier
- Cardiovascular disease: 6-8 years earlier
- Hypertension: 4-5 years earlier



Abbreviations: AA, African American; AI/AN, American Indian/Alaska Native; ARI, acute respiratory illness; CI, confidence interval; COPD, chronic obstructive pulmonary disease; COVID-19, coronavirus disease 2019; ED, emergency department; ESRD, end stage renal disease; LRTI, low respiratory tract infection; NH, non-Hispanic; NH/PI, Native Hawaiian/Pacific Islander; PICOTS, population, intervention, comparator, outcome, time, and study design; RSV, respiratory syncytial virus; SDI, social deprivation index; SDOH, social determinants of health; SES, socioeconomic status; SLR, systematic literature review; SSS, subjective social status; US, United States.

CONCLUSIONS

Racial and ethnic minority and other disadvantaged populations experience health inequities related to RSV infection.

The potential impact of RSV vaccination on health equity is an important consideration in developing vaccine recommendations for older adults.

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Emily K Horn and Elizabeth M La are employees of and hold shares in the GSK. Shahnaz Khan and Meryem Bektas are employed by RTI Health Solutions who received funding from GSK. All authors declare no other financial and no non-financial conflicts of interest.

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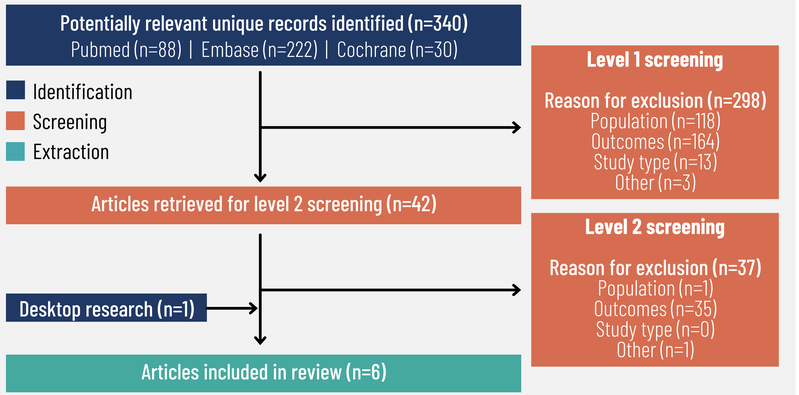
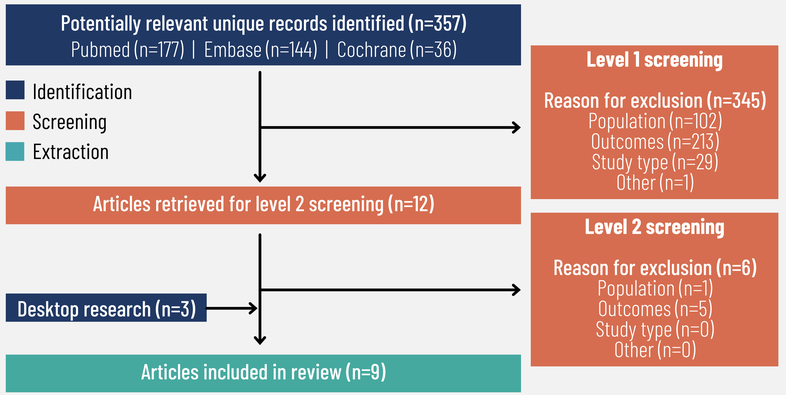
SUPPLEMENTARY INFORMATION

PRISMA FLOW DIAGRAMS

Disparities in RSV diagnosis and RSV-related outcomes



Disparities in ARI Diagnosis and ARI-Related Outcomes



PICOTS STUDY ELIGIBILITY CRITERIA

	Description
Population	• Adults (≥18 years old) with RSV/general ARI* • Adults (≥18 years old) with a comorbid condition that increases their risk of severe RSV-related outcomes (i.e., chronic cardiopulmonary condition, diabetes, chronic liver disease, or chronic kidney disease)
Intervention	No intervention restriction
Comparators	No comparator restriction
Outcomes	• Disparities in RSV risk factors (i.e., chronic cardiopulmonary condition, diabetes, chronic liver disease, or chronic kidney disease) by race, ethnicity, and other SDOH • Disparities in RSV/general ARI* diagnosis by race, ethnicity, and other SDOH • Disparities in RSV/general ARI-related* outcomes by race, ethnicity, and other SDOH
Time	Date of publication: January 1, 2012 to December 31, 2022 (last 10 years)
Study design	• Include: database studies, cross-sectional studies, survey studies, observational studies, literature reviews • Exclude: clinical trials, case reports, editorials
Other limits	Studies conducted in the US or included US in the analysis

*Given the limited number of studies on RSV-related disparities and because RSV is often not accurately identified as the causative pathogen of an ARI due to undertesting/underdiagnosis, inclusion criteria were expanded to encompass disparities in general ARI.

STUDY LIMITATIONS

- **Limited literature:** There are very few studies reporting data on differences in RSV diagnosis or RSV-related outcomes among adults by race and ethnicity or other SDOH.
- **Generalizability:** The study and population characteristics of the few existing studies limit generalizability of the results nationally.
- **Search terms:** The search strategy included specific search terms, which may have resulted in the exclusion of articles where this information was not specified.
- **Quality assessment:** An assessment of the methodological quality of the included studies (e.g., assessment of publication bias) was not conducted.
- **COVID-19 impact:** The scope of this literature review did not include the potential impacts of the COVID-19 pandemic on disparities in RSV risk factors, diagnosis, and outcomes (e.g., access to testing and healthcare, health seeking behaviors).

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