

Incidence and burden of medically and non-medically-attended *Mycoplasma pneumoniae*, 2024-2025

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Marshfield Clinic Research Institute

PACC-ER Study Team



inSPIRE Study Team



Background

- *Mycoplasma pneumoniae* is a common cause of acute respiratory infections (ARI)
 - Extrapulmonary conditions occur; serious complications possible
- Significant re-emergence in northern hemisphere in fall of 2023 after absence during COVID-19 restrictions
 - From April to Sept 2023 the incidence of *M. pneumoniae* globally was 4.12%¹
- Most data on *M. pneumoniae* comes from children with medically-attended illness, primarily from emergency department and hospital settings
- Burden is likely underestimated as *M. pneumoniae* infections often mild and self-limited

¹ Meyer Sauter PM, Beeton ML, et al. *Mycoplasma pneumoniae*: delayed re-emergence after COVID-19 pandemic restrictions. *Lancet Microbe* 2024; **5(2)**: e100–e101.

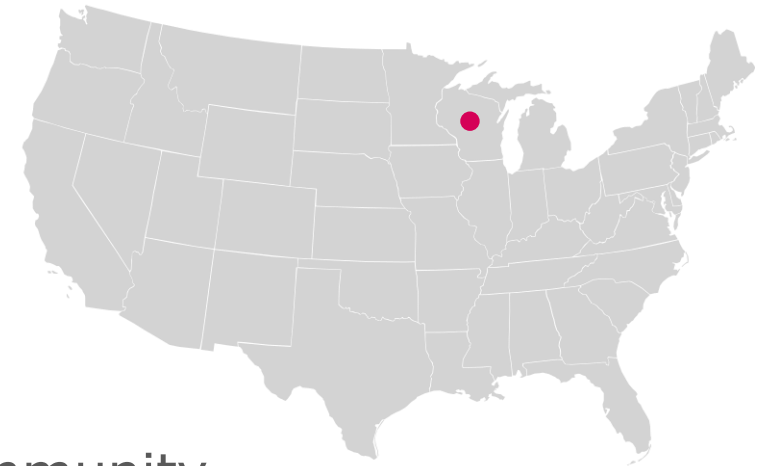
Objectives

Two studies in 2024-2025 to assess incidence, clinical characteristics, and outcomes of respiratory and enteric pathogen infection

- PACC-ER: community cohort study
- inSPIRE: medically-attended surveillance study

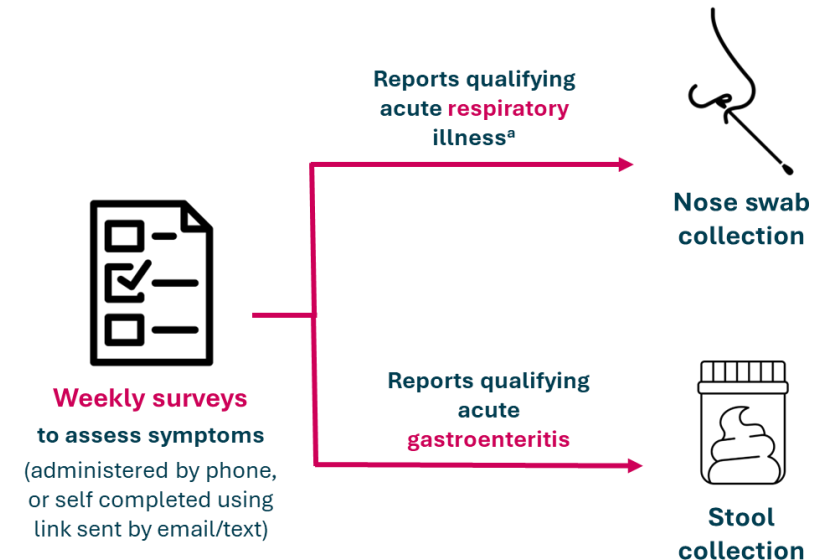
Analysis Objectives:

- To estimate incidence of *M. pneumoniae* in the community
- To describe *M. pneumoniae* infections that were medically-attended and non-medically-attended



Prospective Assessment in a Community Cohort: Enteric and Respiratory Pathogens (PACC-ER)

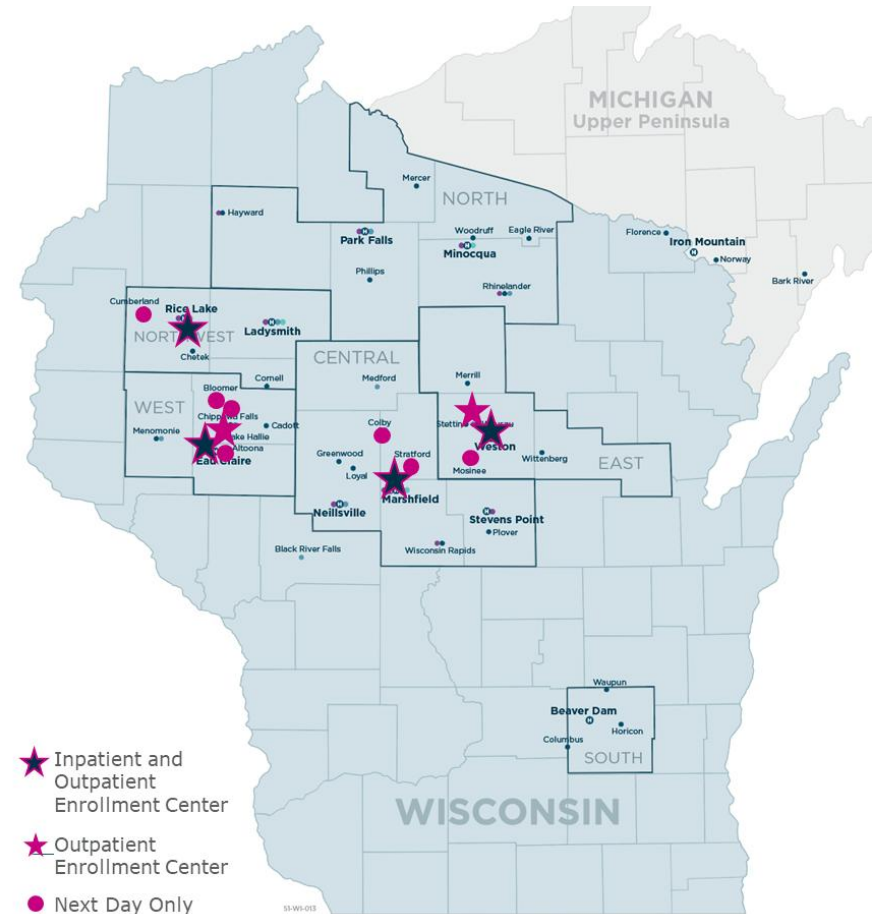
- Prospective community cohort of persons of any age living near Marshfield, WI, USA
 - Oversampled children <5 years and adults ≥ 65 years of age
- Participants with ARI self-collected shallow nasal swabs at home and returned by mail
- Acute illness and follow-up surveys completed to collect illness severity and impact data
- Analysis period: 26SEP2024 – 30JUN2025



^a **Qualifying acute respiratory illness (ARI):** an illness with new onset in the past 7 days and ≥ 1 of the following symptoms: cough, sputum production, nasal congestion, runny nose, sore throat, wheezing, or shortness of breath; or fever or “feverishness” in children aged <3 years.

Surveillance Platform for Medically Attended Acute Illness: Respiratory and Enteric Pathogens (inSPIRE)

- Study staff recruit and enroll patients with ARI^a or acute gastroenteritis in 13 outpatient clinics and 4 hospitals
- Research staff collect throat and nose swab from participants with ARI
- Enrollment and follow-up surveys completed to collect illness severity and impact data.
- Analysis period: 01JUN2024 – 30JUN2025



^a **Qualifying acute respiratory illness (ARI):** an illness with new onset in the past 7 days and ≥ 1 of the following symptoms: cough, sputum production, nasal congestion, runny nose, sore throat, wheezing, or shortness of breath; or fever or “feverishness” in children aged <3 years.

Respiratory Specimen Testing

- Respiratory specimens in transport medium from both studies were tested in a CLIA-accredited research laboratory
- GenMark ePlex® Respiratory Pathogen Panel 2, multiplex reverse transcription polymerase chain reaction (RT-PCR) test
- Case definition:
 - Research-collected sample
 - Positive for *M. pneumoniae*

18 Targets of ePlex® Pathogen Panel

Target	Pathogen Type	Target	Pathogen Type
Influenza A*	Virus	Seasonal coronavirus (229E, HKU1, NL63, OC43)	Virus
Influenza A/H1N1	Virus	Human metapneumovirus	Virus
Influenza A/H1N1pdm09*	Virus	Human rhinovirus/enterovirus	Virus
Influenza A/H3N2*	Virus	Parainfluenza 1	Virus
Influenza B*	Virus	Parainfluenza 2	Virus
SARS-CoV-2*	Virus	Parainfluenza 3	Virus
RSV-A*	Virus	Parainfluenza 4	Virus
RSV-B*	Virus	<i>Chlamydia pneumoniae</i>	Bacteria
Adenovirus	Virus	<i>Mycoplasma pneumoniae</i>	Bacteria

Estimation of Incidence Proportion

PACC-ER (community cohort)

- Cohort incidence proportion of symptomatic *M. pneumoniae* calculated as:

$$\text{Cohort Incidence Proportion} = \frac{\text{Number of individuals infected in cohort}}{\text{Total enrolled in cohort}}$$

Estimation of Incidence Proportion

inSPIRE (medically-attended surveillance study)

- Lab test positivity for study participants was extrapolated to source population members with medically-attended acute respiratory illness (MAARI) to estimate the number of infections in the source population

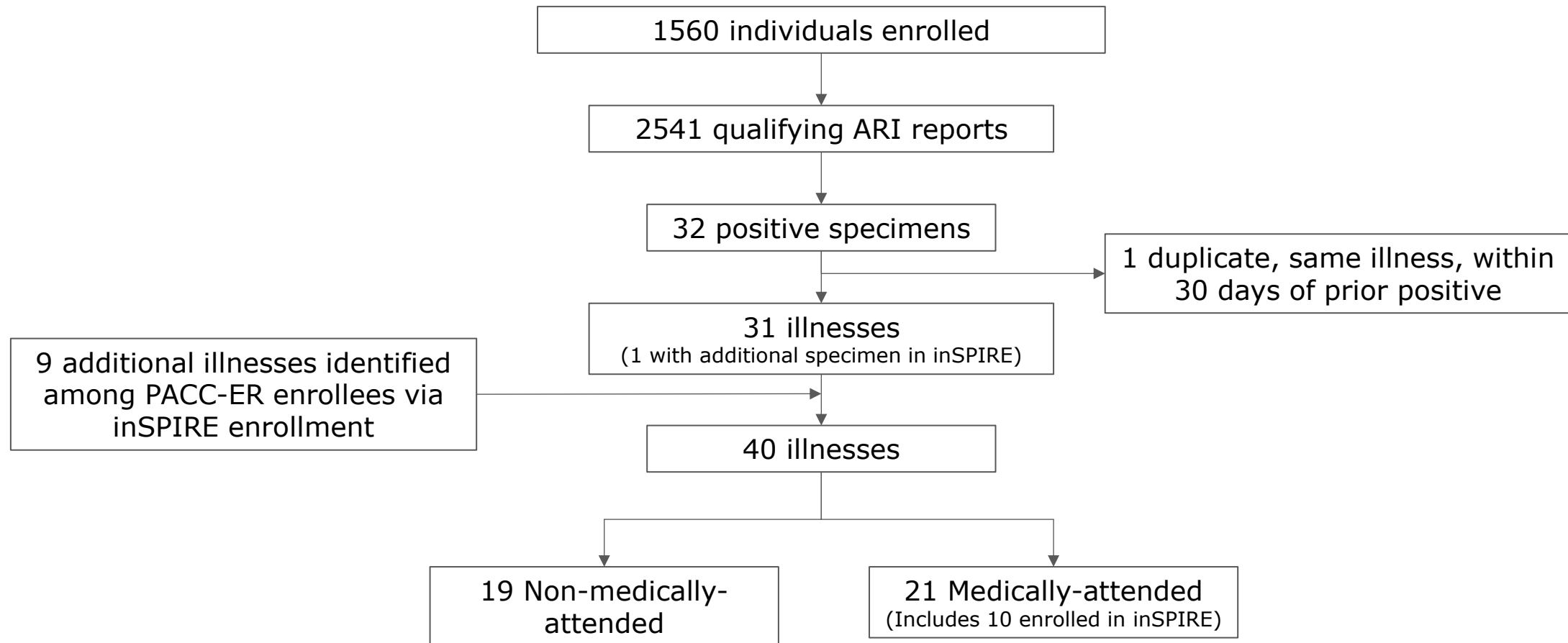
$$\text{Population Incidence Proportion} = \frac{\text{Estimated number of individuals infected in source population}}{\text{Total source population}}$$

- Analyses performed using Poisson models
 - Weighted by age group and chronic medical conditions
 - Offset terms utilized to account for source population members without MAARI visit during study period

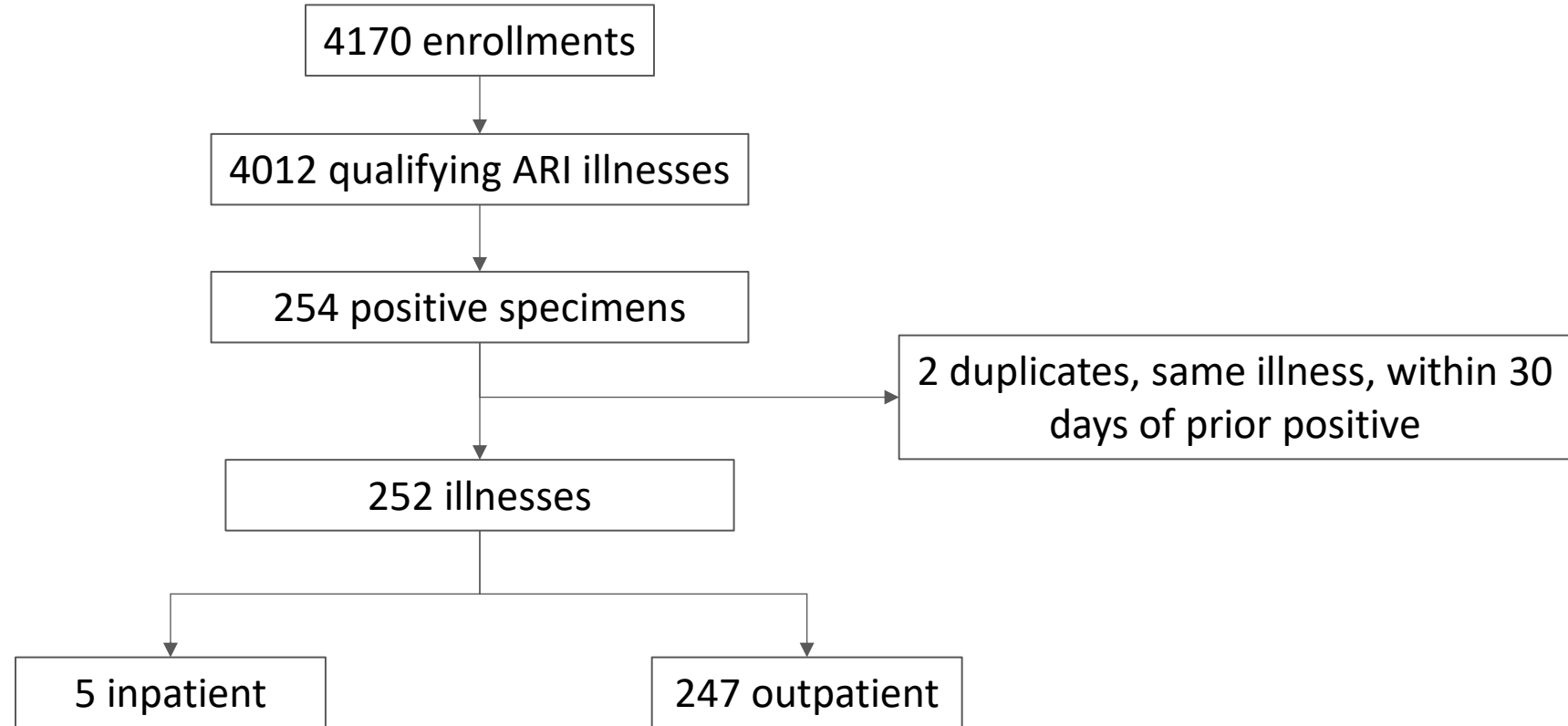
Descriptive Analysis

- Compared characteristics of participants:
 - Medically-attended cases = inSPIRE + PACC-ER who sought medical care
 - Non-medically-attended = PACC-ER
- Burden evaluated using self-reported survey data on:
 - Duration of illness
 - School and work (caregiver) absenteeism

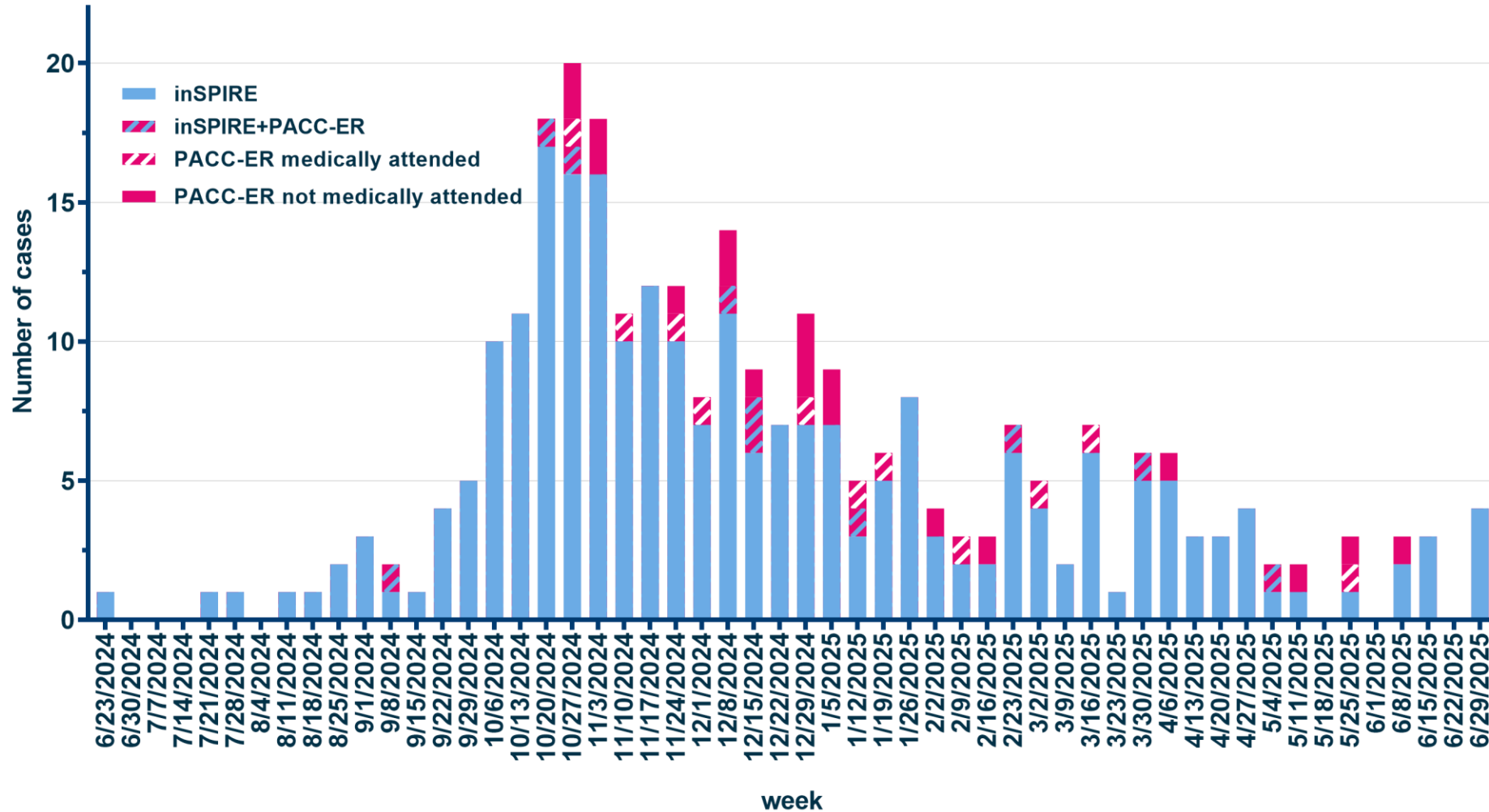
PACC-ER *M. pneumoniae* Cases



inSPIRE *M. pneumoniae* Cases

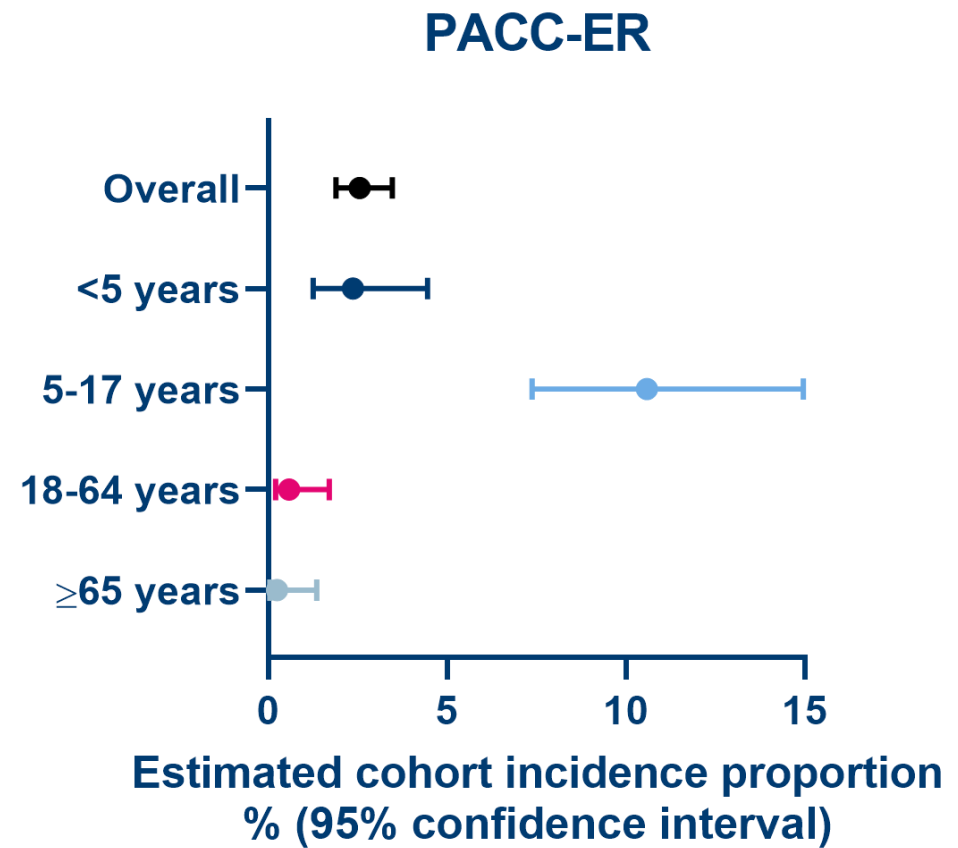
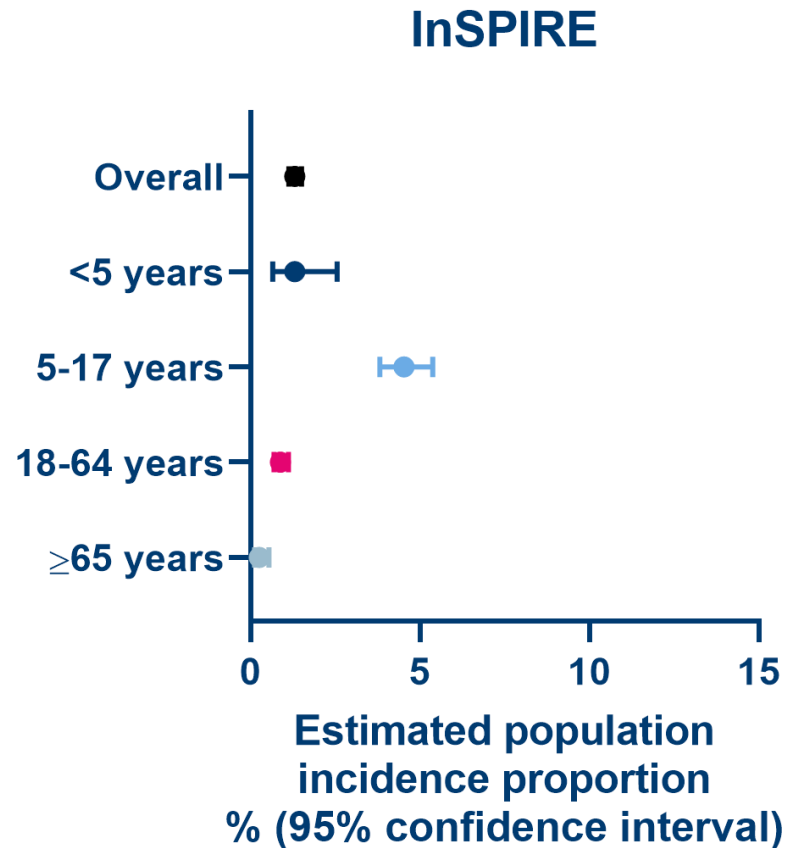


Timeline of Cases



*Active surveillance for PACC-ER study began Sept 26, 2024. PACC-ER participants who were enrolled in inSPIRE were identified post-hoc.

Incidence Highest in Age 5-17 Years



Characteristics of *M. pneumoniae* Cases

	Non-medically-attended No. (%)	Medically-attended No. (%)
Age Group		
<5 years	6 (35)	12 (5)
5-17 years	11 (58)	149 (57)
18-64 years	1 (5)	93 (35)
≥65 years	1 (5)	9 (3)
Female	7 (37)	134 (51)
Race		
Non-Hispanic White	17 (89)	241 (92)
Hispanic	2 (11)	7 (3)
Co-infected	10 (53)	49 (19)
Total	19	263

Symptom Duration and Absenteeism

	Non-medically-attended No. (%)	Medically-attended No. (%)
Duration of Symptoms	N=10	N=147
<5 days	4 (40)	5 (3)
5-7 days	1 (10)	13 (9)
≥8 days	5 (50)	129 (88)
Number reporting daycare/school attendance	N=11	N=95
Number (%) missing at least 1 day of daycare/school	1 (9)	82 (86)
Median (min-max) days missed per infection	0 (0-3)	3.5 (0-14)
Number reporting caregiver work attendance	N=15	N=108
Number (%) with caregiver missing at least 1 day of work	0 (0)	57 (53)
Median (min-max) days of caregiver work missed per infection	--	1.5 (0-11)

Limitations

- Incidence calculations in PACC-ER are limited by later start of surveillance
- Did not examine antibiotic resistance
- Approximately 40% of participants did not complete follow up, limiting data available on burden of illness

Conclusions

- Only 53% of community cases sought medical care; studying medically-attended cases misses significant burden
- During 2024-2025, *M. pneumoniae* posed a significant burden with respect to incidence and medical visits
 - 3.5 days of daycare/school missed
- Incidence in this analysis was slightly lower than reported globally in 2023-2024¹

¹ Meyer Sauter PM, Beeton ML, et al. Mycoplasma pneumoniae: delayed re-emergence after COVID-19 pandemic restrictions. *Lancet Microbe* 2024; **5(2)**: e100–e101.