Absenteeism due to Acute Respiratory Illness in Children, 2024-2026

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Background: Acute respiratory illnesses (ARIs) are common among children and lead to substantial morbidity, although the disease burden varies by infecting pathogen. Absenteeism, or time away from daycare/school or work, is an important measure of this burden. Dynamic seasonal patterns and changing community health behavior motivate contemporary estimates of ARI-related absenteeism. This study estimated daycare/school and household work absenteeism among individuals <18 years who tested positive for ≥1 of 11 ARI pathogens and evaluated differences by coinfection and vaccination status.

Methods: This study leveraged data from a community cohort and a medically-attended surveillance study carried out from 2024 to 2026 in the Marshfield Clinic service area. Both studies identified children with ARI and tested them via multiplex respiratory panel. Follow-up surveys assessed absenteeism in ill children and their caregivers. Stratified sample means with 95% confidence intervals were calculated. Days missed were modeled using negative binomial regression with a pathogen × medical care interaction and cluster robust standard errors to account for repeated measures. Among rhinovirus/enterovirus-positive cases, absenteeism was compared by coinfection status. Among influenza-positive cases, absenteeism was compared by vaccination status.

Results: The study population included 2,773 children with laboratory-confirmed infection, of whom 1,563 (56%) had a single infection and attended daycare/school 14 days before illness onset. Among <5-year-olds, absenteeism due to non-medically attended infection was highest for influenza A(H1N1) (2.1 days, 95% CI: [1.6, 2.8]) and lowest for seasonal coronavirus (0.4 days, 95% CI: [0.1, 1.0]). Among 5-12-year-olds, absenteeism was highest for influenza A(H1N1) (2.2 days, 95% CI: [0.8, 5.7]) and lowest for rhinovirus/enterovirus (0.3 days, 95% CI: [0.2, 0.5]). Among 13-17-year-olds, absenteeism was highest for RSV (1.6 days, 95% CI: [0.9, 3.0]) and lowest for rhinovirus/enterovirus (0.2 days, 95% CI: [0.2, 0.4]). Household work absenteeism largely followed similar patterns. The effect of medical care on absenteeism varied by pathogen, with an estimated increase in average days missed ranging from 61% for adenovirus (RR = 1.6, p = 0.48) to 516% for seasonal coronavirus (RR = 6.2, p = <0.001). Among rhinovirus/enterovirus cases, coinfection was associated with greater absenteeism (RR = 1.4, p = <0.001). Among influenza-positive cases, vaccination was associated with lower absenteeism (RR = 0.71, p = 0.002).

Conclusions: These findings provide updated estimates of the societal burden associated with ARI pathogens in children. They also demonstrate that influenza vaccination may be beneficial in reducing burden when breakthrough infections occur. Furthermore, differences between medically-attended and non-medically-attended illnesses highlight the importance of community-based studies for estimating disease burden. These estimates may help inform public health planning and improve understanding of the broader consequences of respiratory illness.