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Leveraging Health Administrative Data to Investigate Maternal Vulnerabilities in Early Life Respiratory Syncytial Virus (RSV) Hospitalizations in Ontario, Canada

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Introduction

Respiratory syncytial virus (RSV) is the leading cause of hospitalization among infants globally. Several RSV vaccine candidates are currently in trial and the severity of RSV-related illness can be reduced with prophylaxis. To optimize delivery of these programs and reduce inequities, a comprehensive understanding of risk factors for severe RSV-related illness is required.

Objectives and Approach

The objective of this study was to quantify the risks of severe, early life RSV-related illness in terms of medical conditions, birth characteristics and novel socio-economic factors. We used linked population-based health and socio-demographic administrative data for all children born in Ontario (Apr 1st, 2012-March 31st, 2018), including laboratory viral testing data for a subset of children, to identify all RSV-related hospitalizations occurring in Ontario before a child's third birthday or end of follow-up (March 31st, 2019). We calculated the relative risk of RSV-related admission, adjusted for several medical complexity and transmission factors. Critically, we leveraged these routinely collected health administrative data to determine the admission risks associated with various novel measures indicative of maternal social vulnerability, such as homelessness and involvement with the criminal justice system.

Results

11,279 RSV-related hospitalizations were identified among 789,484 children; 57% of admissions occurred before 6 months of age. We identified several socio-economic factors independently associated with increased risk of severe RSV-related illness, including several maternal factors: young age at first delivery (Relative risk (RR) <20 vs 40+ years: 2.27, 95%CI:(1.89,2.73)), involvement with the criminal justice system [RR:1.34 (1.16,1.55)], social assistance use (RR:1.53 (1.45,1.62)), homelessness [RR:1.69 (1.01,2.83)], mental health/addictions concerns [RR:1.51 (1.36,1.67)] and child apprehension [RR:1.59 (1.29,1.96)].

Conclusion / Implications

We identified several socio-economic factors independently associated with increased risk of severe RSV-related illness, including several novel factors related to maternal vulnerability. This information could inform the selection of high-risk groups for RSV prophylaxis or immunization programs.

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