Children's Hospital of Philadelphia PolicyLab

COVID-19 Pandemic-related Reductions in Pediatric Asthma Exacerbations Corresponded with an Overall Decrease in Respiratory Viral Infections

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BACKGROUND: Respiratory viruses, air pollutants, and aeroallergens are all implicated in worsening pediatric asthma symptoms, but their relative contributions to asthma exacerbations are poorly understood. A significant decrease in asthma exacerbations has been observed during the COVID-19 pandemic, providing a unique opportunity to study how major asthma triggers correlate with asthma activity. OBJECTIVE: To determine whether changes in respiratory viruses, air pollutants, and/or aeroallergens during the COVID-19 pandemic were concomitant with decreased asthma exacerbations. METHODS: Health care utilization and respiratory viral testing data between January 1st, 2015 and December 31st, 2020 were extracted from the Children's Hospital of Philadelphia (CHOP) Care Network's electronic health record. Air pollution and allergen data were extracted from U.S. Environmental Protection Agency public databases and a National Allergy Bureau-certified station, respectively. Pandemic data (2020) were compared to historical data. RESULTS: Recovery of in-person asthma encounters during phased re-opening (June 6th - November 15th, 2020) was uneven: primary care well and specialty encounters reached 94% and 74% of pre-pandemic levels, respectively, while primary care sick and hospital encounters reached 21% and 40% of pre-pandemic levels, respectively. During the pandemic, influenza A and influenza B decreased to negligible frequency when compared to pre-pandemic cases, while RSV and rhinovirus infections decreased to low (though non-negligible) pre-pandemic levels, as well. No changes in air pollution or aeroallergen levels relative to historical observations were noted. CONCLUSIONS: Our results suggest that viral respiratory infections are a primary driver of pediatric asthma exacerbations. These findings have broad relevance to both clinical practice and the development of health policies aimed at reducing asthma morbidity.

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