Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Our study should be interpreted in the context of several potential limitations. The small sample size and short duration of the camp may not have been sufficiently powered to detect a statistically significant difference in FENO and PF or to prove an asthma camp does not increase the risk of COVID-19 infection for our campers. Although all counselors and staff were vaccinated against COVID-19, testing was not required, so asymptomatic infection may have gone undetected. Rapid testing for COVID-19 was not readily available at the time of Camp Wheez 2021. Dependence on reported symptoms and questionnaires reflects subjective rather than objective measures for COVID-19 incidence.

We share our experience of having an educational asthma program for children during the COVID-19 pandemic, though no differences in FENO or peak flow were noted between groups. We strive to provide a balance of providing resources for our children with asthma while ensuring safety by following public health guidance. We wanted to be able to offer a much-loved experience for our children with asthma but, understandably, the COVID-19 pandemic will make certain experiences impossible to replicate as compared with before. The risks and benefits must always be weighed on an ongoing basis during the ever-changing climate of the COVID-19 pandemic.

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Effects of coronavirus disease 2019 pandemic on children, adolescents, and young adults with asthma in Rhode Island: Patterns in emergency department utilization with geospatial mapping

Despite early concerns for increased asthma exacerbations owing to the respiratory involvement of coronavirus disease 2019 (COVID-19), trends indicate *decreases* in the frequency of emergency department (ED) visits and asthma-related hospitalizations for children, adolescents, and young adults with asthma during spring 2020 when the first COVID-19 cases emerged and were rising in the United States.[1,2] Less is known as to whether these patterns were maintained throughout summer and fall months of 2020 as the COVID-19 rates continued to increase. To the best of our knowledge, there are no published reports on asthma-related ED utilization *by geographical area*, to identify high-risk communities before and during the COVID-19 era. This would help identify high-risk communities to target for continued intervention, to enhance education on COVID-19–related safe practices, and optimal asthma management strategies.

Lifespan is Rhode Island's (RI) largest health system with several hospitals and partners spanning the state, including Rhode Island Hospital (RIH). The pediatric division of RIH, Hasbro Children's Hospital (HCH), located in urban Providence, RI, is home to the vast majority of inpatient pediatric care in the state. The ED at HCH serves more than 50,000 pediatric patients/y[3] representing a wide diversity of racial, ethnic, and socioeconomic groups. Pre–COVID-19, the HCH ED served approximately 3327 patients with asthma-related difficulties annually; an average of 324 pediatric patients were hospitalized for asthma-related difficulties at HCH annually pre–COVID-19.

We aimed to examine current trends in ED utilization and hospitalizations for youth and young adults (aged 0-21 years) with asthma in RI during the early COVID-19 era (January 1, 2020-October 31, 2020) compared with pre–COVID-19. Furthermore, we utilized geospatial mapping to identify ED utilization and specific community "hot spots" before and during the early COVID-19 era; findings will help to better understand changes in ED utilization over time within specific high-risk neighborhoods to target interventions where they are needed geographically. Lastly, we provide maps of RI indicating geographic distribution of COVID-19 rates to provide additional context and further inform how the spread of the virus in specific communities may have concurrently influenced ED utilization.

Data were collected from electronic health records from the Lifespan health system which includes 5 hospitals with EDs across RI, including HCH. ED visits and hospital encounters with asthma-related International Classification of Diseases, Tenth Revision, codes (eg, J45.2: mild intermittent asthma, J45.3: mild persistent asthma) for children, adolescents, and young adults (aged 0-21 years) were compiled. Data were collected from the same 10-month period (January-October) to compare frequencies pre–COVID-19 (2018, 2019) and during the early COVID-19 era (2020). Longitudinal time series plots (X statistical process control charts) were used to depict trends in ED visits and hospitalizations during the pre–COVID-19 and COVID-19 era periods. Paired *t* tests were utilized to compare (1) average frequency of asthma-related ED visits and (2) the number of ED visits that resulted in a hospitalization, both during pre–COVID-19 vs COVID-19 era periods. Geospatial mapping was also utilized to compare utilization rates across the same time periods by geographical area using patient ZIP codes. Data from the RI Department of Health (DOH) were utilized to map the median COVID-19 cases/mo from March to October 2020 by ZIP code to supplement the ED utilization maps and provide additional context.

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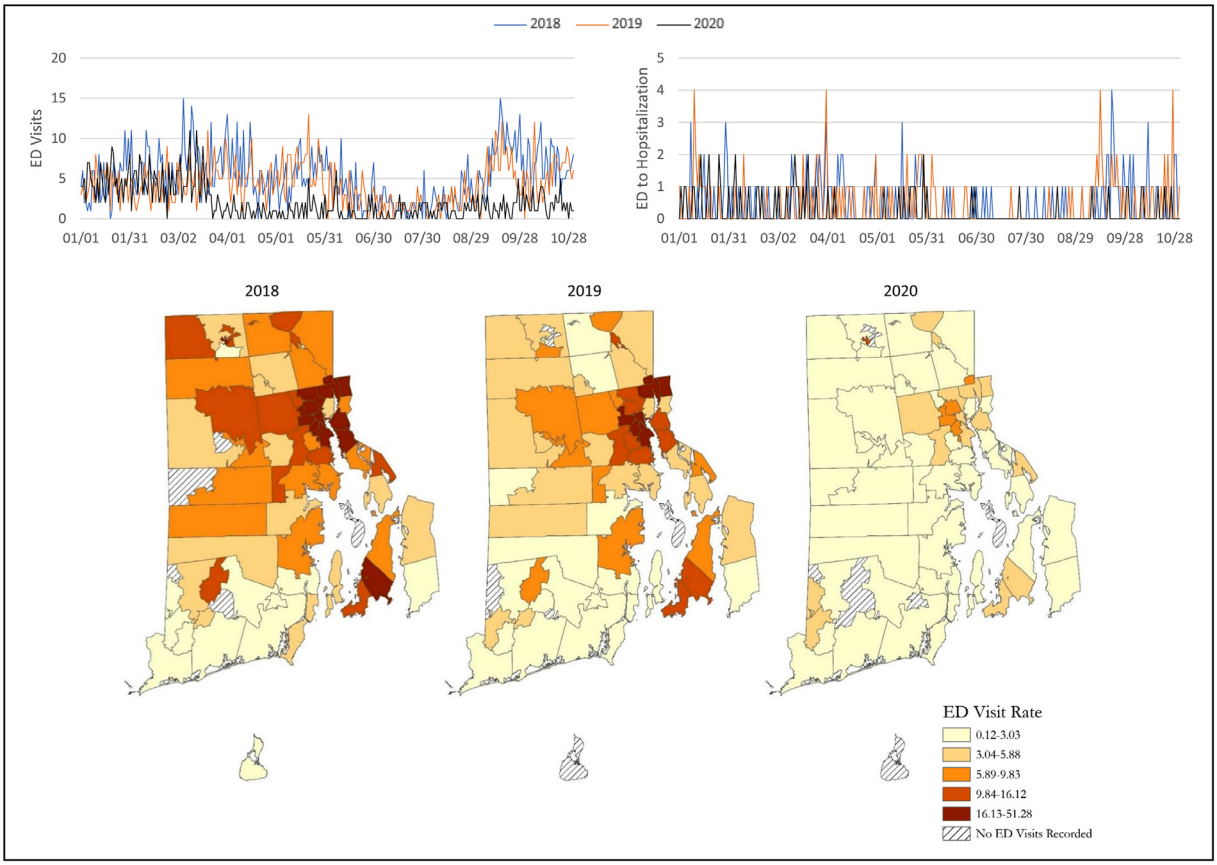

Figure 1. Daily asthma ED visits (top left) and ED visits to hospitalizations (top right) with geospatial maps (bottom) for period January 1 to October 31, 2018 to 2020. ED, emergency department.

Data indicate that the average number of asthma-related ED visits during 2018 was 5.15 ± 3.25 visits/d, during 2019 was 4.25 ± 2.59 visits/d, and 2.09 ± 2.19 visits/d during the same period in 2020. These correspond to significant differences in ED utilization for asthma between 2018 and 2020 ($P < .001$) with an average of 3.06 ± 3.72 visits/d less in 2020 compared with 2018. Similarly, for 2019 vs 2020, there were significantly fewer visits in 2020 ($P < .001$), with an average difference of 2.16 ± 3.27 visits/d (Fig 1). Notably, this trend also preceded COVID-19, with significant decreases in ED utilization between 2018 and 2019 ($P < .001$).

Similarly, data indicate a significant reduction in asthma-related hospitalizations (ED visit turned inpatient) in 2018 vs 2020 (mean reduction between 2018 and 2020 of 0.26 ± 0.86, $P < .001$) and between the same period in 2019 compared with 2020 (mean reduction 0.23 ± 0.83, $P < .001$) (Fig 1).

Geospatial maps (Fig 1) for pre–COVID-19 and COVID-19 era periods indicate utilization rates by ZIP code and demonstrate higher ED utilization among our most high-risk communities. For additional context, geospatial maps for median monthly COVID-19 cases by ZIP, highlighting areas with highest proportion of population in poverty, are available on request; additional information regarding COVID-19 rates by ZIP is available via RI DOH website.[4]

Data demonstrate a decrease in asthma-related ED visits and hospitalizations in RI from 2018 to 2019 (possibly owing to the preexisting and increased community-based intervention efforts in high-risk communities by our team and the RI DOH) and during the COVID-19 era, compared with typical pre–COVID-19 periods, providing important insight into factors that may contribute or minimize asthma exacerbations among youth and young adults. Findings are consistent with other published data, reported from urban hospitals in the Northeast (eg, Philadelphia,[1] Boston[2]), though they extend existing knowledge by identifying the *prolonged* decrease, beyond the first several months of the COVID-19 pandemic. In addition, although the current study was observational and does not directly assess the underlying mechanisms, several contributing factors may be driving decreases in utilization patterns during this period. The closing of schools and implementation of COVID-19–safe practices (eg, social distancing, masking) played an important role in decreasing infectious triggers (eg, rhinovirus) and exposure to allergens and irritants (eg, pollution) that can exacerbate asthma symptoms.[5] Furthermore, high proportion of fear related to asthma has been found among urban minority caregivers which may contribute to additional worry regarding taking youth to an emergency setting.[6] Future research should shed light on the extent to which individuals actually experienced symptoms in the home setting during this period and how youth and caregivers responded to these symptoms to inform contributors to management behaviors and health care utilization patterns.

COVID-19 also accelerated the use of telemedicine and virtual approaches to disease management across health conditions, likely introducing more cost-effective and convenient models of service delivery for patients with asthma. Future studies should aim to understand how telemedicine was utilized during the COVID-19 era among urban, minority youth with asthma.

RI's singular DOH also instituted a COVID-19 response plan[7] to increase testing and vaccination in the most affected, high-risk communities. It is not surprising that the utilization patterns observed pre–COVID-19 and during the COVID-19 era were consistent with the proportion of COVID-19 rates that were seen across the high-risk communities. Even with these mitigation efforts demonstrated by the DOH and additional community initiatives to address COVID-19 rates, other multilevel contributors to health disparities in general

(eg, socioeconomic status, structural racism, neighborhood disadvantage) need to be considered.

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Safety of a modified environmental rush immunotherapy protocol in the pediatric population

Check for updates

Allergen immunotherapy (AIT) is an effective treatment option for patients with allergic rhinitis. The traditional build-up administration regimen consists of weekly to biweekly subcutaneous injections of allergens at increasing doses until a therapeutic or maintenance dose is reached. Six months of maintenance injections are typically needed to illustrate clinical improvement.[1] Rush IT (RIT) features an accelerated build-up schedule that substantially shortens the time needed to reach maintenance dosing. The main benefits of RIT include faster symptom resolution, fewer injections, and reduction of dosing errors. However, RIT protocols are associated with an increased risk of systemic allergic reactions.[2] Modified RIT protocols (MERIT) were found to be better tolerated and entail the combination of rush and traditional build-up regimens.[3]

Evaluation of the safety and efficacy of subcutaneous RIT in the pediatric population has been limited. Sublingual RIT drops were found to be effective in providing symptom relief in children.[4,5] Studies reporting the safety of subcutaneous IT in children have been limited to an ultrarush schedule with modified allergen extracts.[6] There have been no published protocols using MERIT to date.

We sought to evaluate the safety of a MERIT protocol in the pediatric population by describing patient characteristics and the occurrence of systemic (SR) or local (LR) reactions. Furthermore, we compared the safety of the MERIT protocol in the pediatric population to our adult population. We retrospectively evaluated patients seen in an outpatient allergy clinic from 2017 to 2019. Patients included were identified by procedure code for rapid desensitization (International Classification of Diseases version 10, code 95180). The institutional review board at our facility approved this study.

The MERIT protocol used in this study is a 1-day outpatient protocol that involved escalating doses of AIT given hourly, beginning with 0.1 mL of the silver vial (1:10,000) and ending with 0.4 mL of the blue vial (1:100).[3] The protocol and pretreatment medications prescribed the day before and on the day of therapy are outlined in Table 1.[3] After

Table 1
Modified Environmental Rush Immunotherapy Protocol

Time	Vial	Dosage (mL)
9:00 AM	Silver vial 1:10,000	0.1
10:00 AM	Silver vial 1:10,000	0.3
11:00 AM	Green vial 1:1000	0.1
12:00 PM	Green vial 1:1000	0.3
1:00 PM	Blue vial 1:100	0.1
2:00 PM	Blue vial 1:100	0.2
3:00 PM	Blue vial 1:100	0.3
4:00 PM[a]	Blue vial 1:100	0.4

[a]Patients were monitored for 1 hour after the last dose. Pretreatment medications were prescribed the day before and the day of therapy as follows: prednisone 0.5 mg/kg once daily for children (max 40 mg) and 40 mg daily for adults, montelukast once daily (age-appropriate dosage), a nonsedating H_1 and H_2 antihistamine daily (age-appropriate dosing). As a safety precaution, all patients were prescribed autoinjectable epinephrine.

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