

Novel use of inpatient syndromic surveillance data to enhance case finding efforts for multi-system inflammatory syndrome in children (MIS-C) during the COVID-19 pandemic



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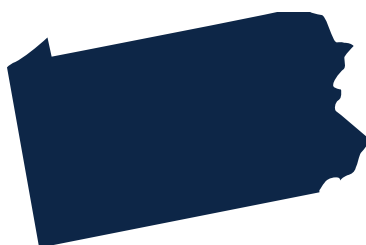
When daily outreach to pediatric tertiary care providers to understand MIS-C case burden was determined to be unsustainable, Pennsylvania Department of Health implemented the use of inpatient syndromic surveillance data to support case finding.

Multi-system inflammatory syndrome in children (MIS-C) is a rare but serious condition associated with COVID-19 and is characterized by inflammation across multiple body systems. Studies have reported that early in the pandemic, MIS-C occurred in approximately 1 in 3,000-4,000 children and adolescents who had been infected with SARS-CoV-2. In the United States, MIS-C disproportionately impacted non-Hispanic Black and Hispanic or Latino children and adolescents. As of November 8, 2023, Pennsylvania has reported 347 confirmed cases of MIS-C. The Pennsylvania Department of Health (PADOH) mandated MIS-C reporting by healthcare providers as part of the COVID-19 public health emergency response. Since the public health emergency ended in May 2023, MIS-C has been voluntarily reportable in PA.



The “What”

Early in the pandemic, physicians within the Bureau of Epidemiology conducted daily outreach to pediatric tertiary care facilities (excluding Philadelphia) to understand the burden of MIS-C in Pennsylvania; however, this surveillance approach was not sustainable. For the majority of the pandemic, PADOH relied on passive reporting by healthcare providers and facilities, with requests for reports communicated to the healthcare community via the health alert network.



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Because MIS-C is a condition that is characterized by a combination of symptoms and other clinical characteristics, rather than identified by a single reportable laboratory test, reporting burden fell heavily on providers at tertiary care facilities who were already overburdened with caring for individuals hospitalized for COVID-19 or MIS-C. PADOH recognized the need to explore alternative case finding methods to understand the epidemiology of MIS-C, while reducing the reporting burden for providers. COVID-19 funds were used to contract with PADOH's syndromic

surveillance vendor to conduct a pilot of using inpatient syndromic data to support MIS-C case finding.

Syndromic surveillance systems typically collect near-real-time emergency department visit data, but using syndromic systems to collect near-real-time inpatient data from hospitals is a novel approach to obtaining hospitalization information. Using these funds, the syndromic vendor was able to obtain and share, via line list, deidentified inpatient data (including admit and discharge ICD-10 codes, patient admit date, date of birth, and zip code) from 40 hospitals in southeastern Pennsylvania. This provided a unique opportunity to assess the effectiveness of using inpatient data obtained through syndromic surveillance as an additional case finding method for MIS-C.

PADOH found that four of the 40 hospitals had admitted patients who were considered potential cases (i.e., were less than 21 years old, were admitted between late December 2020 and August 2022, and had the MIS ICD-10 code, M35.81) included as either an admission or discharge diagnosis. For the purposes of this pilot, follow-up efforts focused on one large pediatric tertiary care center. Lists of potential cases were matched with cases that had been previously reported to public health to identify new, previously unreported cases.





PADOH's novel use of inpatient syndromic surveillance identified 51 new cases of MIS-C from a single tertiary care facility. This increased case counts by 18%

The "So What"

As a result of this initiative, PADOH identified 51 new cases of MIS-C from a single tertiary care facility, which increased overall case counts in PA by 18%. These cases would not have been identified without funding for this project. Because MIS-C is rare, data obtained from each and every case are essential to better characterize the epidemiology of the syndrome and to create and disseminate clear and relevant prevention messaging. Additionally, as a result of this project, the tertiary care facility was able to identify gaps in their internal reporting processes, implement process adjustments, and improve reporting timeliness.



The "Now What"

The results of the pilot project suggest that syndromic inpatient data could be a useful adjunct to traditional reporting methods when trying to understand the burden of disease within a jurisdiction. Advantages to using inpatient syndromic data may include: 1) the ability to track hospitalization trends on a near-real-time basis; and 2) since syndromic data collects information on all admissions, conditions that are not (yet) reportable can be tracked, as long as an ICD-10 code has been assigned and implemented. Inpatient syndromic data may be particularly useful for tracking syndrome-based diseases, which traditionally relied on reporting by overburdened healthcare providers.

Based upon the success of this pilot project, PADOH plans to provide additional funding to their syndromic vendor to expand inpatient data collection to more hospitals across

the Commonwealth and to assess its feasibility for other conditions. These use cases will lay the groundwork for broader use of inpatient syndromic data and will prepare PADOH to enhance case finding or monitor hospitalization trends during future disease response events.

The potential implications of this work are widespread; however, they rely heavily on continued funding to support vendor engagement and are not sustainable if funding is not available. The pilot project was a time-consuming effort, even when focusing on a single tertiary care facility. Further validation may require additional staff or student interns to fully assess the feasibility of this modernization effort.

Key contributors to this project include Kirsten Waller, Pennsylvania Department of Health.