Characteristics of newcomers diagnosed with varicella or pertussis, 2020-2025

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Background

Pertussis and varicella are reportable, vaccine-preventable diseases in Minnesota. Refugees often receive pertussis and varicella vaccinations overseas and/or after arrival in the United States; however, limited data exist on disease occurrence in this population. This cross-departmental evaluation aimed to assess the proportion of pertussis and varicella cases among refugees and individuals with a preferred language other than English (PLOE).

Methods

Data sources

- **Disease surveillance**: Demographic and clinical data for pertussis and varicella cases (confirmed, probable, suspect, and undefined) reported to the Minnesota Department of Health (MDH), 2020–2025.
- **Vaccination history**: From the Minnesota's statewide immunization registry, healthcare records, and case investigations.
- **Refugee arrivals**: From the MDH Refugee Health Program database (1987-2025) including primary and secondary arrivals.

***Note**: The term "refugee" includes all Office of Refugee Resettlement-benefit eligible groups (refugees, asylees, Special Immigrant Visa-holders, Afghan and Ukrainian humanitarian parolees, Cuban-Haitian Entrants, Amerasians, and certified victims of human trafficking).*

Data matching

Refugee records were linked to disease cases using:

1. **Primary match**: Exact name and date of birth.
2. **Secondary match**: Phonetic algorithms with manual review to account for spelling variations.

Statistical analysis

Descriptive analyses were used to evaluate:

- Proportion of cases occurring among the refugee population.
- Demographic/clinical characteristics of refugees vs. individuals with a Preferred Language Other than English (PLOE).
- Key differences in disease presentation and history between refugee and PLOE groups.

Results

- Between 2020 and 2025 there were 4,724 pertussis cases and 1,270 varicella cases reported to MDH.
  - 1% (N=46) of pertussis cases had a PLOE.
  - 8% (N=107) of varicella cases had a PLOE.
- These were matched to 105,370 refugee arrivals from 1987-2025.
  - The top countries of origin among refugee arrivals to MN during this time were Somalia (27%), Laos (Hmong) (16%), Burma (10%), Ethiopia (7%), and Vietnam (6%).
- Seventeen (<1%) reported pertussis cases matched to a refugee arrival.
- Nine (1%) reported varicella cases matched to a refugee arrival.

Varicella

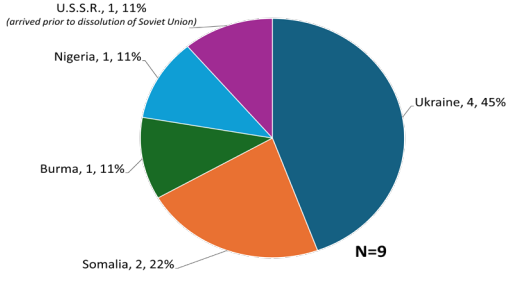
- The median time from U.S. arrival to when varicella case was reported to MDH was 1.8 yrs (range: 4 months – 31 years).
  - 67% (N=6) were diagnosed with varicella within four years of U.S. arrival.
- 44% (N=4) arrived with a status that did not require an overseas medical exam (three Ukrainian humanitarian parolees and one U.S.-granted asylee).

Table 1. Characteristics of Varicella Cases across Refugees, those with a PLOE, and Non-Refugee/PLOE, 2020-2025

	Refugee cases (N=9)	PLOE cases* (N=106)	Non-Refugee, Non-PLOE cases* (N=1,155)
Median age (range)	23 yrs (5-42 yrs)	8 yrs (4 mos – 52 yrs)	6 yrs (<1 mo – 72 yrs)
Ever been vaccinated for disease	5 (56%)	31 (29%)	416 (36%)
Hospitalized for disease	0 (0%)	4 (4%)	18 (2%)
Laboratory testing done for disease	5 (56%)	46 (43%)	424 (37%)

**Excluding any refugee cases*

Figure 1. Country of Origin among Refugees Diagnosed with Varicella from 2020-2025



Pertussis

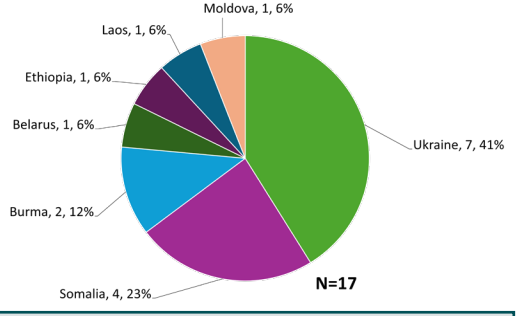
- Among refugees who got pertussis from 2020-2025, the median time from U.S. arrival to when pertussis case was reported to MDH was 1.5 yrs (range: 1 months – 32 years).
  - 76% (N=13) were diagnosed with pertussis within three years of U.S. arrival.
- 41% (N=7) arrived as Ukrainian humanitarian parolees who did not require an overseas medical exam.

Table 2. Characteristics of Pertussis Cases across Refugees, those with a PLOE, and Non-Refugee/PLOE, 2020-2025

	Refugee cases (N=17)	PLOE cases* (N=46)	Non-Refugee, Non-PLOE cases* (N=4,724)
Median age (range)	11 yrs (2-43 yrs)	11 yrs (4 mos – 74 yrs)	13 yrs (<1 mo – 92 yrs)
Ever been vaccinated for disease	12 (71%)	32 (70%)	3,443 (74%)
Hospitalized for disease	1 (6%)	4 (9%)	80 (2%)
Laboratory testing done for disease	14 (82%)	43 (93%)	4,332 (93%)

**Excluding any refugee cases*

Figure 2. Country of Origin among Refugees Diagnosed with Pertussis from 2020-2025



Scan QR code to visit the Refugee Health Program
https://www.health.state.mn.us/communities/rih/index.html

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Discussion

- Given most cases among refugees occurred in the first few years after arrival, there is a potential increase in susceptibility in the early post-arrival period.
  - May reflect gaps in vaccination coverage, differences in immunization schedules, and barriers to accessing healthcare services during resettlement.
- A notable proportion of cases in both groups occurred among individuals who did not undergo an overseas medical examination suggesting missed opportunities for early vaccination assessment and preventive care.
- Findings underscore the importance of post-arrival health assessments, access to immunization services, and implementing targeted outreach strategies to reduce the burden of vaccine-preventable diseases in refugee populations.

Limitations

- Preferred language was not available for all reported varicella and pertussis cases (missing for 107 (8%) varicella cases and 3,312 (70%) pertussis cases).
- Some vaccination history was based on self-report and unverifiable.
- This analysis did not include the following:
  - Those who developed pertussis and/or varicella and who were not reported to MDH.
  - Those who were diagnosed with pertussis and/or varicella outside of Minnesota.
  - A refugee who resettled in another state and subsequently moved to Minnesota (and MDH was not notified of the move).

Acknowledgments

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