



Outbreak Response Testing of Measles in New Arrival Shelters – Chicago, 2024

Kendall Anderson MS, MPH, MB(ASCP)^{CM}

Chicago Department of Public Health

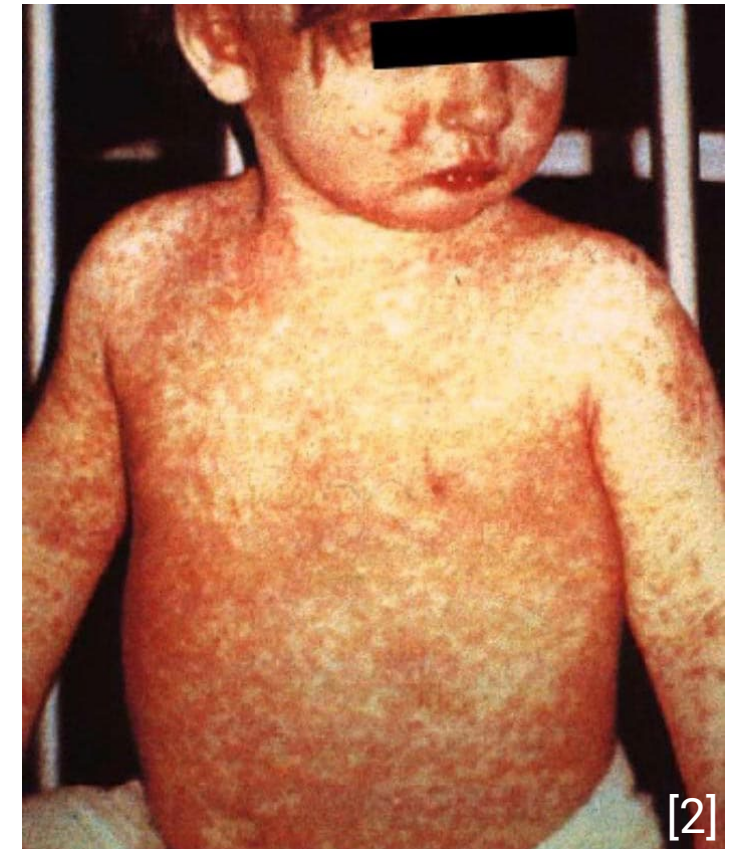


Conflicts of Interest Statement

- I, Kendall Anderson, do not have any conflicts of interest to declare for the following presentation and content.

★ What is Measles?

- Highly Contagious – can infect 9 out of 10 susceptible individuals. **Considered one of the most infectious disease known.** ^[1]
- **Airborne pathogen** spread through coughing, sneezing, and through air droplets. Able to remain infectious in the air for up to two hours. ^[1]
- Defining symptoms is the **maculopapular rash** and fever. ^[1]
- **Individuals can be infectious and can transmit virus 4 days prior to rash onset and 4 days after.**
- Serious Health Complications – Especially for children younger than 5 years of age. ^[1]

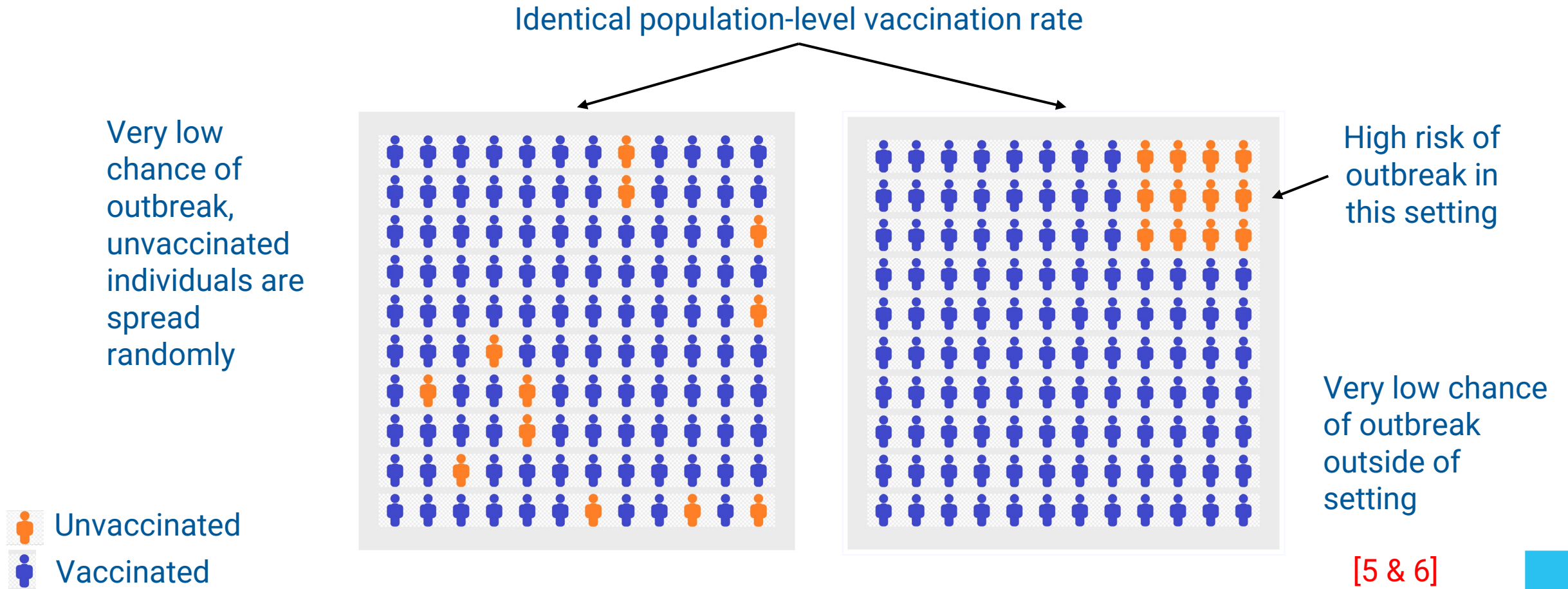




How do you test for measles and define a case?

- **Molecular - RT-PCR** (Preferred 0-3 days within rash onset.)
- **Serology based test – IgM/IgG Antibodies**
 - In regions where measles is considered eradicated, such as the US, using **IgM/IgG methods increase the risk of false-positives** due to **cross-reactivity** with more common viral pathogens.
- **Confirmatory Laboratory Evidence for Cases:**
 - 1. Acute febrile rash
AND
 - 2. Positive detection of measles-virus nucleic acid via PCR.
OR
 - 3. Positive IgM
OR
 - 4. Direct epidemiologic linkage to a laboratory confirmed case.

★ Measles outbreaks occur in under-vaccinated Tight-Knit communities



★ Since 2022, Chicago has welcomed over 45,000 new arrivals.

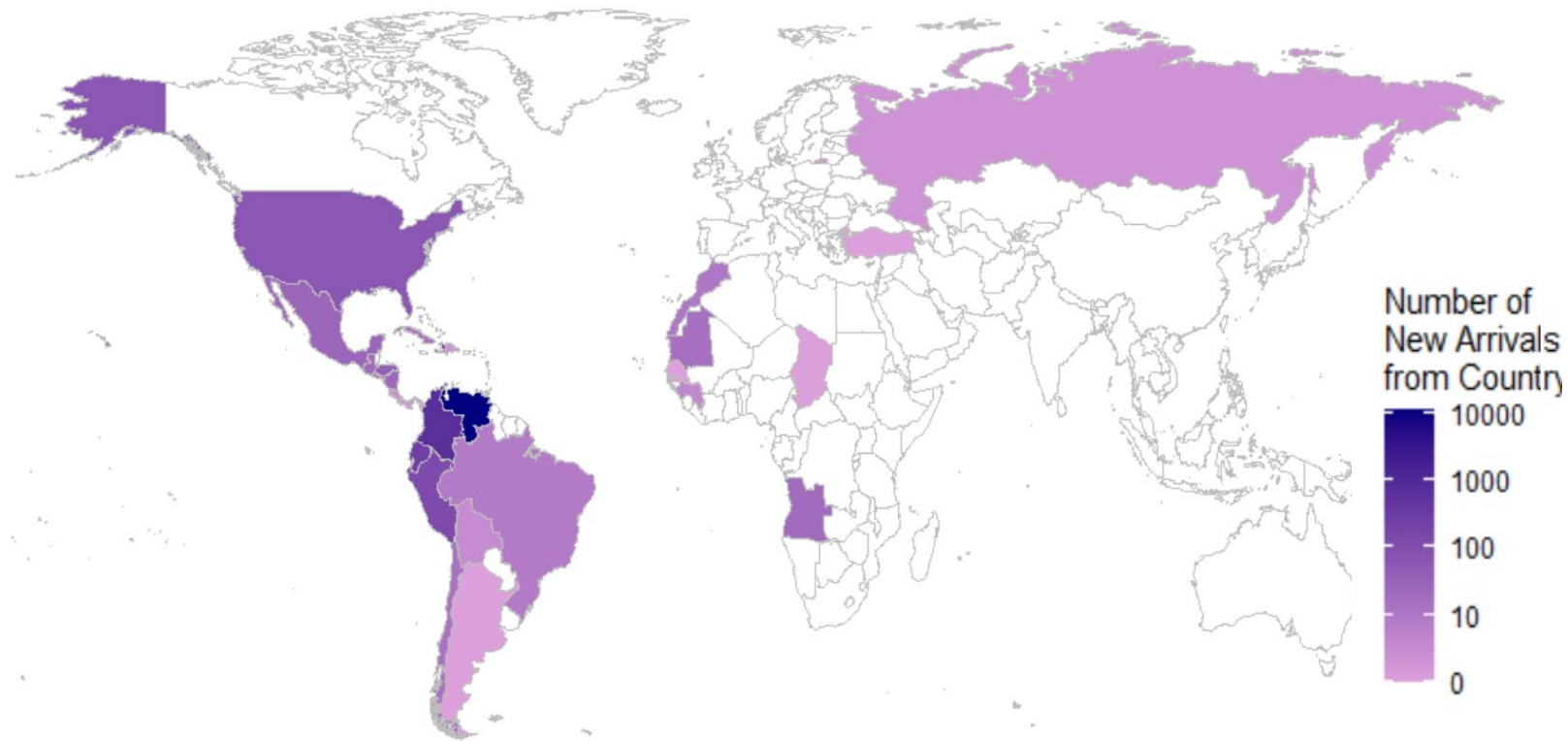


Recently arrived migrants sit on cots and the floor of a makeshift shelter operated by the city at O'Hare International Airport. Photo: Armando L. Sanchez/Chicago Tribune/Tribune News Service via Getty Images



Volunteers with the Zakat Foundation serve food to asylum-seekers in the basement of St. Bartholomew Catholic Church in the Portage Park neighborhood Tuesday. Months after the city and Archdiocese of Chicago began talks about opening a shelter at the shuttered school, residents have moved in. | Tyler Pasciak LaRiviere/Sun-Times

★ Most 'New Arrivals' migrated from Venezuela

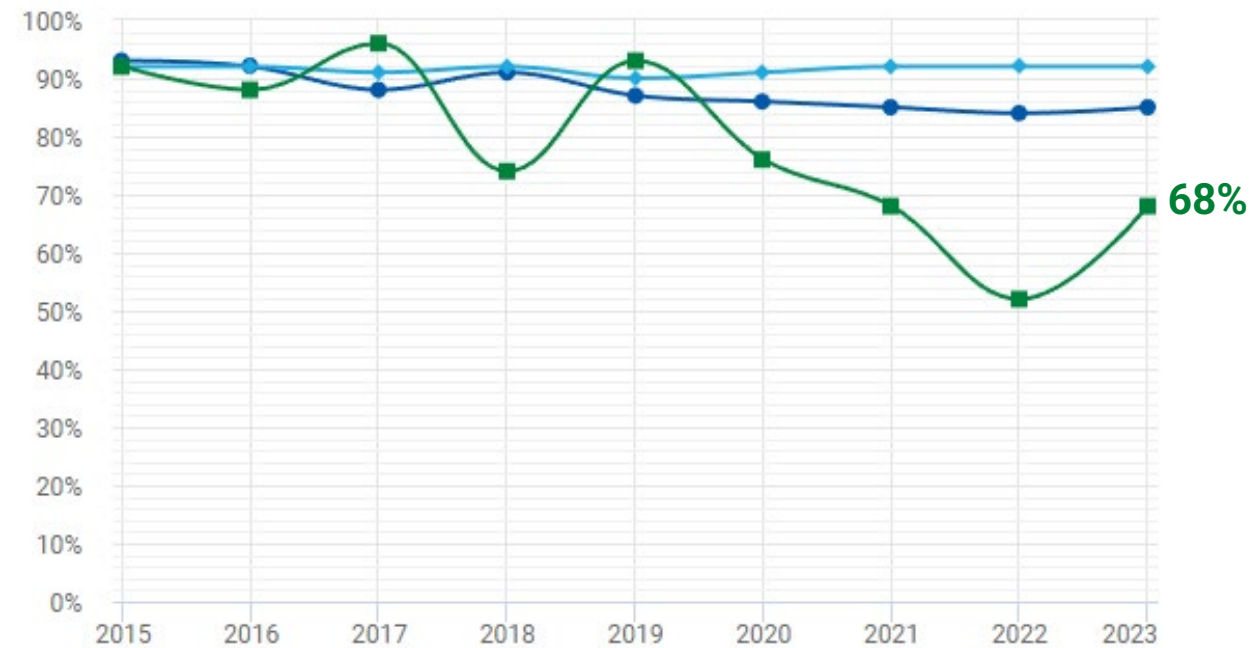


86% from Venezuela
7% from Colombia
2% from Ecuador
1% from Peru
1% from Haiti

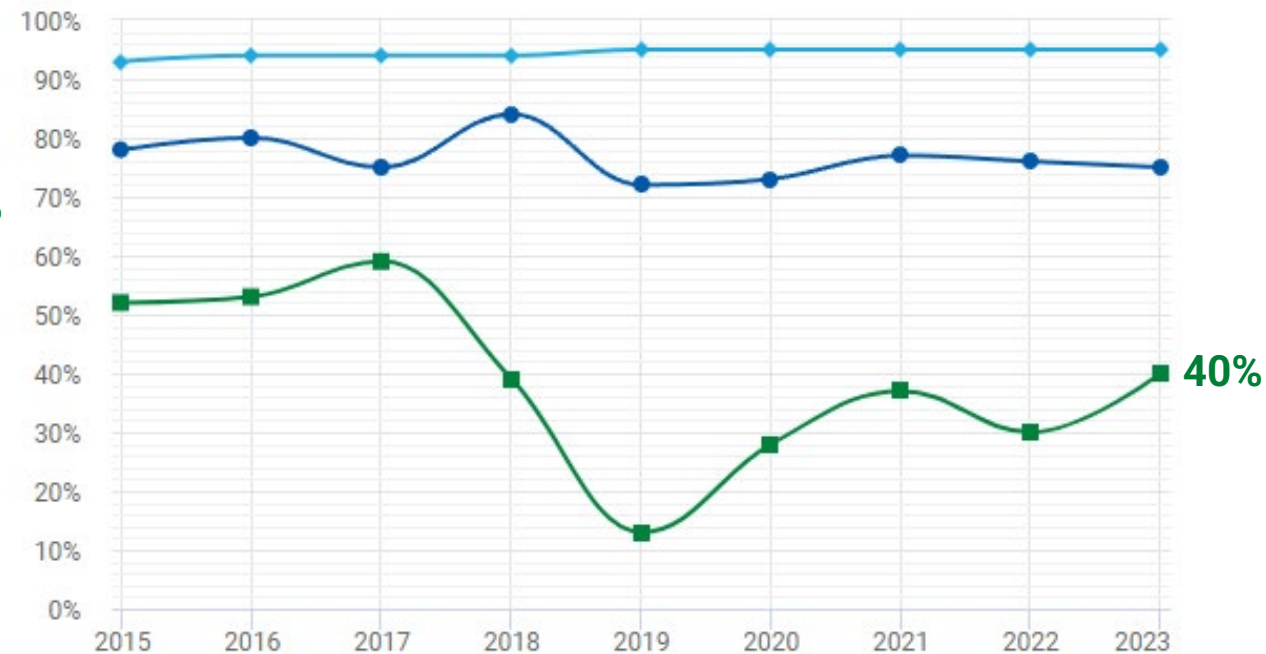
Origin countries of new-arrivals living in Chicago's shelter system

★ Measles vaccine coverage in Venezuela has declined since 2017

Measles 1st dose coverage



Measles 2nd dose coverage

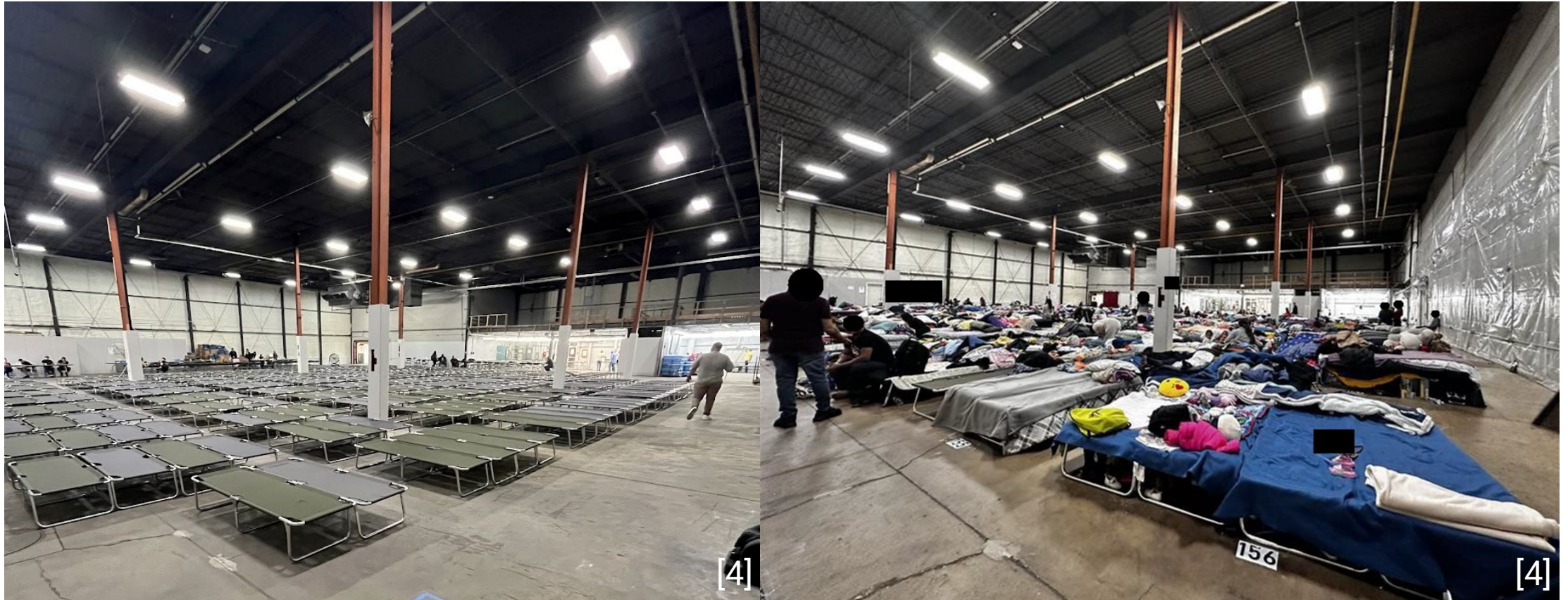


◆ U.S.A.

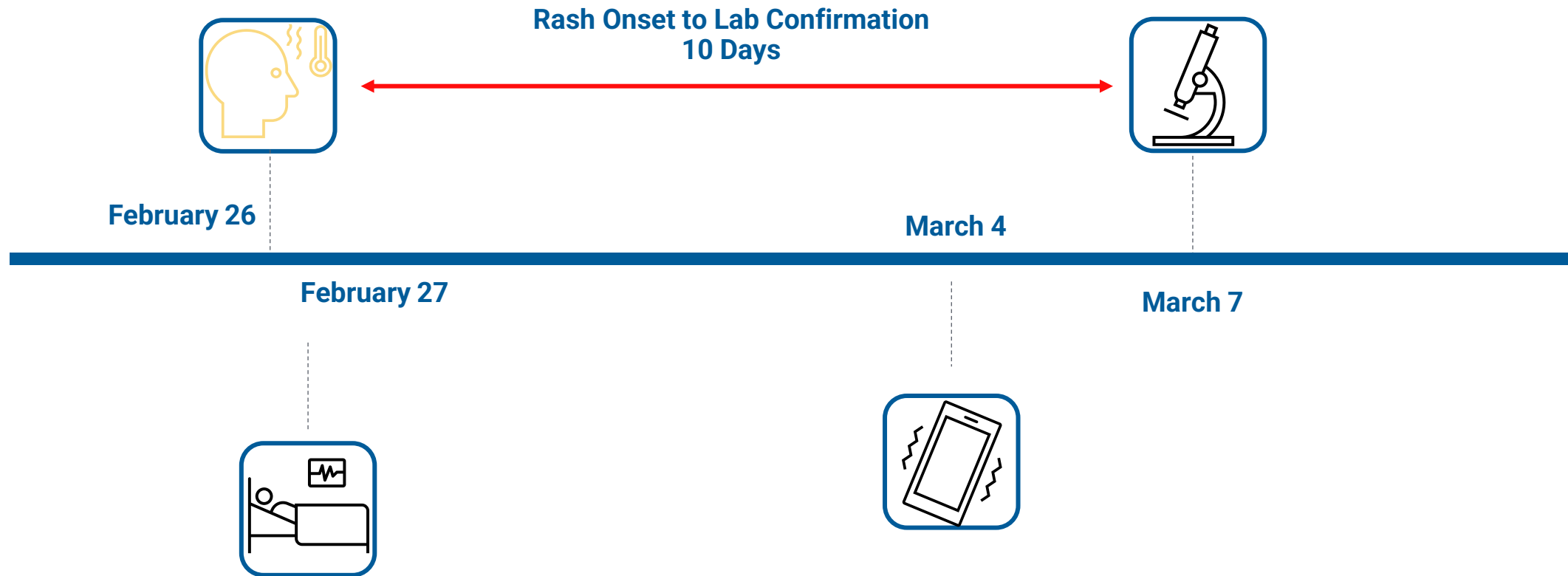
● Americas Region

■ Venezuela

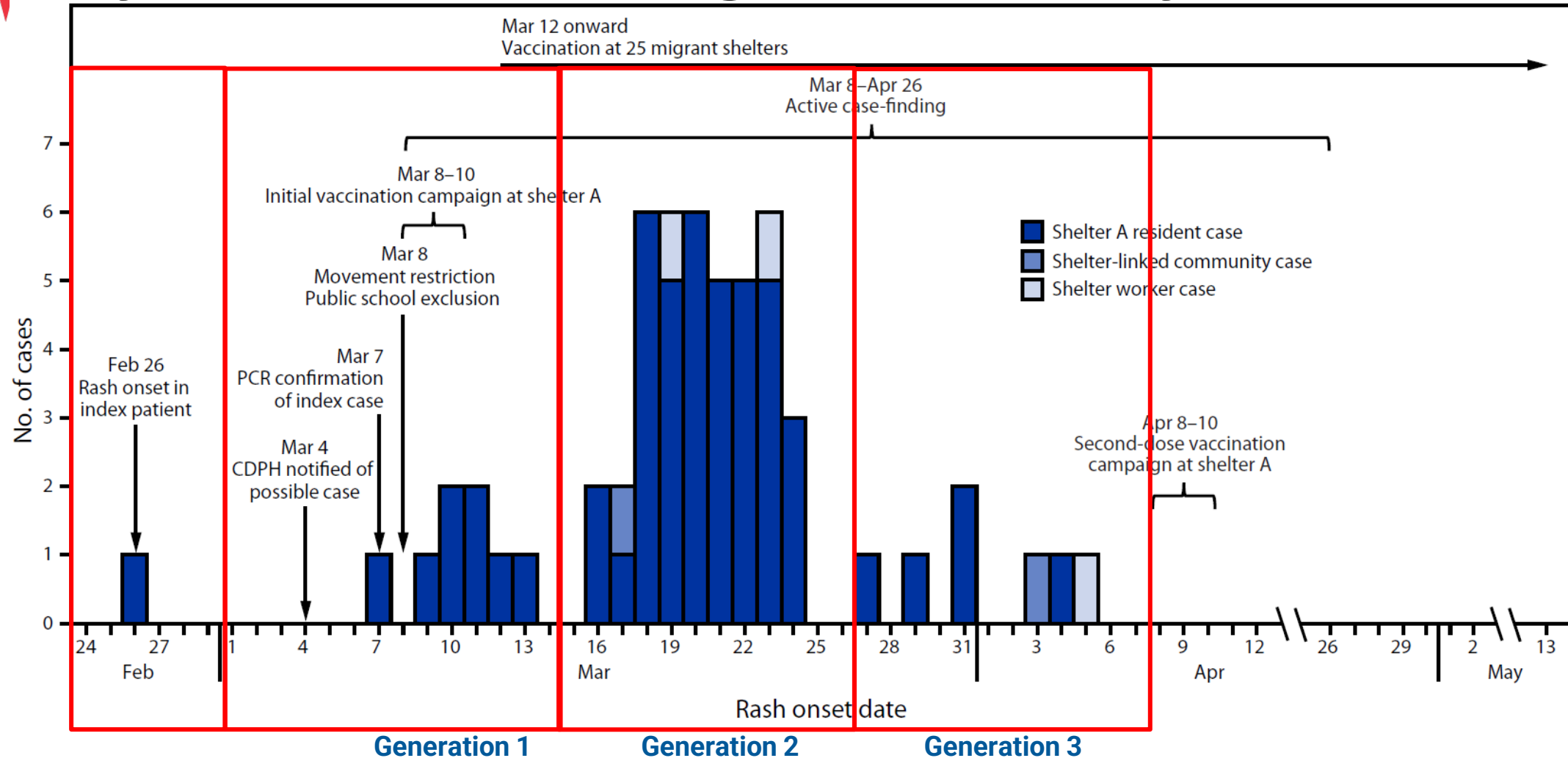
★ Shelter A - Congregate Layout



★ Shelter A - Index Case Event Timeline



57* measles cases associated with Shelter A by rash onset, Chicago Feb 26-May 13, 2024

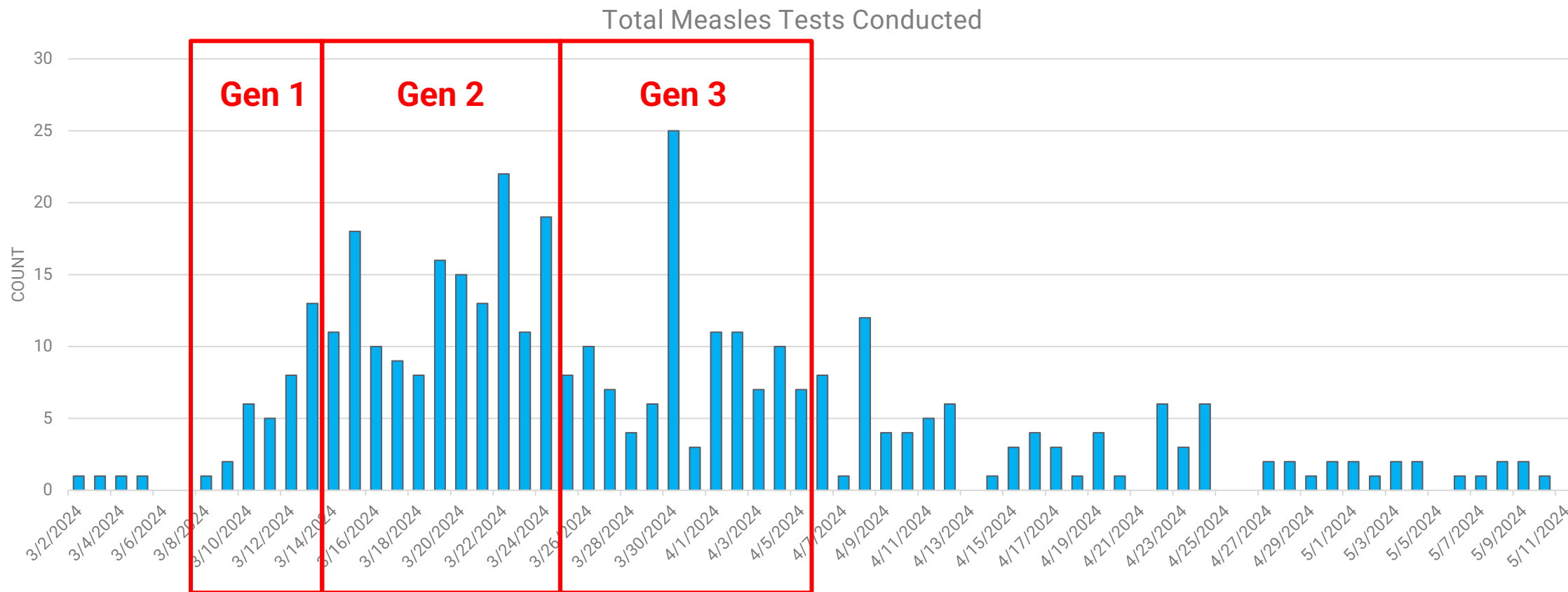


[3]

*One additional shelter-linked case was detected residing out of state.



A vastly larger testing environment for shelters and the community – 408 Tests





The Rapid Response Team (RRT) Assessment and Testing

- **Consult and Testing via Rapid Response Team (RRT)**
 - RRT comprised of a **team of clinical staff** (doctors, nurses, and clinical volunteers) and a Spanish speaking member.
 - Quick action team that can **respond in less than 24 hours** to perform assessment and testing during public health threats.
- **Shelter Response:**
 - RRT establishes a temporary clinic within the shelter at scheduled dates and times.
 - Follows up with flagged migrants from the assessment screener.
- **Community Response:**
 - RRT is able to rapidly deploy to homes, workplaces, or temporary sites to assess and test community cases same day.

★ Shelters Screening

- **Symptom Screening**
 - Shelter and CDPH staff conduct symptom monitoring using a uniform screening tool.
 - Those individuals presenting symptoms are flagged for follow up testing with CDPH.
 - Those individuals with severe symptoms were sent to local hospitals.

Any of the following: • Fever ¹ <i>and</i> new rash² • Fever ¹ <i>and</i> either: • new cough, <i>or</i> • Coryza, <i>or</i> • conjunctivitis	Any of the following: • Fever ¹ alone • Any new rash alone • Cough <i>and</i> either: • coryza <i>or</i> • conjunctivitis	• All else
Isolate OFFSITE ³ . Pursue testing ⁴ .	Pursue testing ⁴ . Remain in shelter: No cohorting/no isolation.	No specific action required. Resident should continue monitoring for any symptoms.

¹ Fever is $\geq 100.4^{\circ}\text{F}$. Subjective fever OK if fever reducing meds taken in last 24h.

² generalized maculopapular rash, non-vesicular

³ Notify site captain or shelter manager to arrange transport to hospital ED for isolation until test result.

⁴ Fill out intake form. Call 311 and ask for medical director on call to arrange testing.

Testing Coordination and Authorization

- **Testing Authorization**

- Two objectives – (1) Shelter testing and (2) provider mediated community testing
- Automation via a survey platform – REDCap
 - Rapid collection of relevant testing and epidemiologic information.
 - Enables medical team to rapidly review and approve testing.
 - Automates the authorization codes (Shelter and Provider), provider guidance, and courier services.
 - Near real time of specimen logistics and resulting.

- **Specimen Submission**

- RRT:
 - The team logs information into the REDCap system and is provided a blanket authorization code.
 - Specimens are submitted at the conclusion of the clinic times to the state laboratory
- Providers:
 - Providers in the community are given a unique authorization code.
 - CDPH provides a courier service of last resort if necessary.



Testing Authorization Platform - REDCap

- Web Based Survey – Public Facing
- Objectives:
 - Collect Information
 - Patient
 - Provider
 - Clinical and Epidemiologic
 - Disseminate Information: clinical, epidemiologic, occupational health, PPE, infection control, and specimen collection / submission information automatically.
 - Automate or Semi-automate testing approvals and authorization codes.

CDPH Suspect Measles Report and Testing Request Form

This form is to report suspect cases and request testing for CHICAGO residents only.

All measles specimen submissions to the IDPH lab must be authorized by CDPH, and receive an authorization number prior to sending.

Find the measles testing decision tree on the [Chicago HAN measles page](#).

To request public health testing, please complete this form to facilitate authorization. Health Department staff will e-mail you to confirm approval for measles testing, and provide initial steps for specimen collection and instructions for isolation. **Test requests received outside business hours (8:00am-5:00 pm, 7 days a week) will be reviewed at the start of the following business day.**

Promptly collect a specimen (see [instructions](#)); however, DO NOT SUBMIT A TEST WITHOUT CDPH APPROVAL.

This system REPLACES provider reporting of suspected cases and testing authorization through 311. DO NOT call 311 or 312-743-7216 to report. If you have other urgent questions, please call 311 (or 312-744-5000, if outside the city but regarding a Chicago resident) and request to speak to the Medical Director on-call.

Person Reporting

Name of person completing this form:

Date/Time reported: 03-20-2025 14:46 M-D-Y H:M

Are you reporting an onsite evaluation at a new arrival shelter or quarantine/isolation shelter?

☐ No ☐ Yes

[reset](#)

* must provide value

Healthcare Provider

Clinic/Hospital Name:

Provider e-mail:

Provider Name:

Provider Phone:



Testing Authorization Platform - REDCap

- Can **rapidly** build and deploy at modifiable **scale**.
- Readjust on the fly.
- Enables digital **standard data collection** for analysis in a single interaction.

Is patient a new arrival* to the United States?
*Arrived in US from a Central/South American country since 1/1/2022

☐ No ☐ Yes ☐ Unknown

[reset](#)

Patient's preferred language

☐ English
☐ Spanish
☐ Other

[reset](#)

Symptom history

If symptom is reported, list onset date next to symptom. Onset date is required for rash and fever.

- ☐ Maculopapular rash
- ☐ Pustular or blistery rash
- ☐ Vesicular rash
- ☐ Fever**
- ☐ Coryza
- ☐ Conjunctivitis
- ☐ Cough
- ☐ Sore throat
- ☐ Otitis media
- ☐ Koplik spots*
- ☐ Light sensitivity
- ☐ Other

Other rash descriptions (optional):

leave sections blank if no rash

Measles causes a maculopapular rash, which is type of rash characterized by a flat, red area on the skin that is covered with small confluent raised bumps

Where did rash start?

Measles rash typically begins on the head/face, then moves downward to neck, trunk, extremities

Where did rash spread to?

Highest fever temp:

leave blank if no fever

**Koplik spots: tiny red spots, with bluish-white centers inside mouth on the lining of the cheek*

***Either a measured or patient/family-reported fever is adequate*

Note: Atypical presentations can occur in people who are vaccinated or received IG. It is characterized by a prolonged incubation period, mild prodrome, and sparse, discrete rash of short duration.

Is the patient currently hospitalized or do you plan to admit them?

☐ No ☐ Yes ☐ Unknown

[reset](#)

Where will the patient be isolating until test results are returned?

e.g., home, name of shelter, name of hospital

* must provide value



Testing Authorization Platform - REDCap

- Built in **automation** for emails.
- Enables the **rapid** disbursement of **information**.

Alert #1: Testing Request Initiated with CDPH

EditOptions

Unique Alert ID: A-3203

🔔 When the instrument "Intake for Suspect Measles and Testing" is saved and has a Complete status.
➡ Send immediately
1x Send one time (only once per record - i.e., never re-trigger)
✖ DEACTIVATED: Alert was deactivated

🕒 Activity: 📧 No alerts sent yet

Alert #2: CDPH Clinical Record Review or Testi...

EditOptions

Unique Alert ID: A-3202

🔔 If the following logic is TRUE when the instrument "Intake for Suspect Measles and Testing" is saved and has any form status: [halsted_yn] <> "1"
🕒 Schedule to send later: 10 minutes after the exact time that the alert was triggered
1x Send one time (only once per record - i.e., never re-trigger)
✖ DEACTIVATED: Alert was deactivated

🕒 Activity: 📧 No alerts sent yet

Alert #3: LBS Follow-Up Alert

EditOptions

Unique Alert ID: A-3201

🔔 If the following logic is TRUE when the instrument "Intake for Suspect Measles and Testing" is saved and has any form status: ([testing_radio]="1") OR ([halsted_yn] = "1")
➡ Send immediately
1x Send one time (only once per record - i.e., never re-trigger)
✖ DEACTIVATED: Alert was deactivated

🕒 Activity: 📧 No alerts sent yet

EmailPreview

From: CDPH Measles Suspect Case and Testing REDCa...

To: [provider_e_mail]

Subject: Request [record_id] for Measles Testing Recei...

This e-mail is to confirm that testing submission [reco...

EmailPreview

From: CDPH Measles Suspect Case and Testing REDCa...

To: [redacted]@cityofchicago.org

Subject: Record [record_id] Testing Auth /Review Requ...

Testing authorization or review has been requested in ...

EmailPreview

From: CDPH Measles Suspect Case and Testing REDCa...

To: [redacted]@cityofchicago.org; [redacted]@cityof...

Subject: Record [record_id] Measles Testing Authoriza...

CDPH has reviewed this request for measles testing a...

Time is of the essence – Key factors to success

- Incident Command System (ICS) and Pre-Existing Response Plans
 - Activating an ICS is instrumental in a **uniform and rapid response**
 - **Pre-existing response** plans set you up for a successful start
 - Establishment and **utilization of liaisons**
- Symptom Assessment
 - Utilization of a standard set of tools
 - Quickly stand-up assessment and continue regular cadence
- Testing
 - **Automation** of data collection for rapid test determination and authorization
 - Pre-established methods of **result communication**
- Rapid Response Team (RRT)
 - Enables a **deployable team** to rapidly assess and test in less than 24hrs.



★ Lessons Learned – Things to plan and watch

- **Novelty of a rapidly spreading pathogen in a congregate setting**
 - Plan, plan, plan! You don't want to plan when you are working a 16-hour day.
 - Maintain local, regional, and global awareness of threats and plan accordingly.
- **Time matters – responding rapidly in force with a plan will drive success**
 - Don't be a silo! Respond as a team and balance the load ahead of time.
 - Adaptation of an in-house emergency response plan or standing ICS structure makes a difference.
 - Turn around time (TAT) of testing impacting hospital bed availability – weekends matter!

Lessons Learned – People Planning and Access

- **Staffing for after hours and weekends**
 - Union vs. non-union staffing
 - Burnout
 - Compensation
 - Language barriers
- **Balancing simplicity of testing access vs. the needs of public health**
 - Takes too long to fill out the form
 - Call system takes at least 10 minutes to reach someone
 - Approval information comes too late

★ Thanks to all our partners...



  **Here to offer support and answer questions**

Kendall Anderson MS, MPH, MB(ASCP)^{CM}

Chicago Department of Public Health

Kendall.Anderson@CityofChicago.org



Citations

1. Centers for Disease Control and Prevention. (n.d.). *About measles*. Centers for Disease Control and Prevention. <https://www.cdc.gov/measles/about/index.html>
2. [Photo Citation] <https://www.cdc.gov/measles/signs-symptoms/photos.html>
3. Gressick K, Nham A, Filardo TD, et al. Measles Outbreak Associated with a Migrant Shelter – Chicago, Illinois, February–May 2024. *MMWR Morb Mortal Wkly Rep* 2024;73:424–429. DOI: <http://dx.doi.org/10.15585/mmwr.mm7319a1>
4. [Photo Citation] - Chicago Department of Public Health Photo Archive
5. Thomas (Dan) Filardo and Chelsea Lutz. Centers for Disease Control and Prevention – Epidemiologic Task Force. Measles Outbreak in Chicago 2024. (2024). NCIRD Scientific Seminar Series.
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