Are You Ready For A Measles Outbreak?

Lessons from Minnesota's IP's

Mumps & Measles—What We've Learned From Recent Outbreaks

Presentation to Washington Vaccine Update

October 27, 2017

Twitter: InfectiousPS

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Topics

- Describe details of the current Minnesota measles outbreak
- Describe interventions required to minimize risk of measles exposure and what to do when an exposure occurs
- Identify actions Infection Preventionists can take before an outbreak occurs

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The New York Times

Minnesota Sees Largest Outbreak of Measles in Almost 30 Years

By CHRISTOPHER MELE MAY 5, 2017

Amira Hassan of Burnsville, Minn., and her father, Mohamud, at the Children's Minnesota specialty clinic in Minneapolis on Tuesday.

Health officials are grappling with the largest outbreak of measles in Minnesota in almost 30 years, which is mainly sickening young children of Somali immigrants who fell under the sway of anti-vaccination activists.

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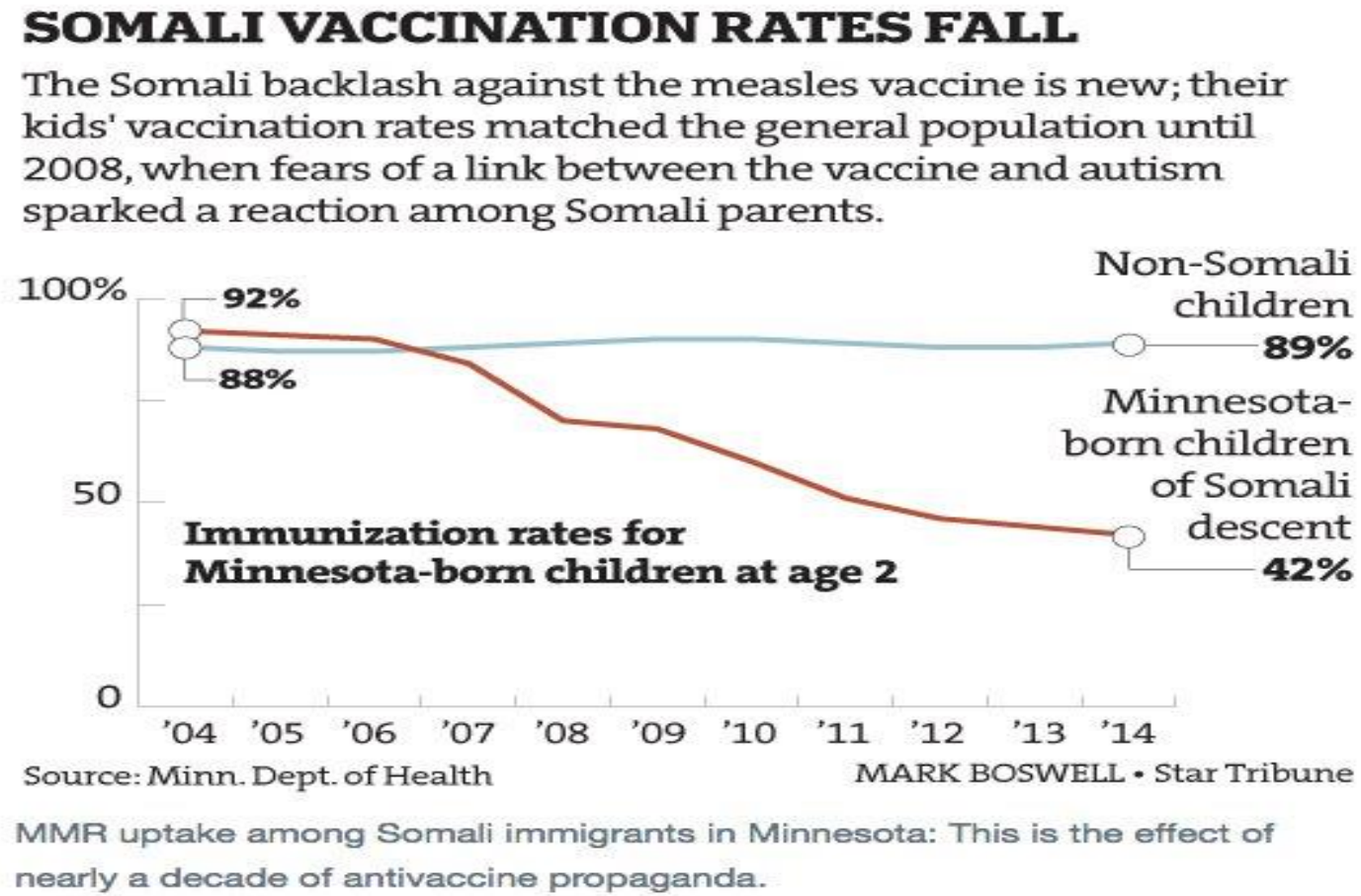
So how did we get in this situation?



Source: MN Department of Health

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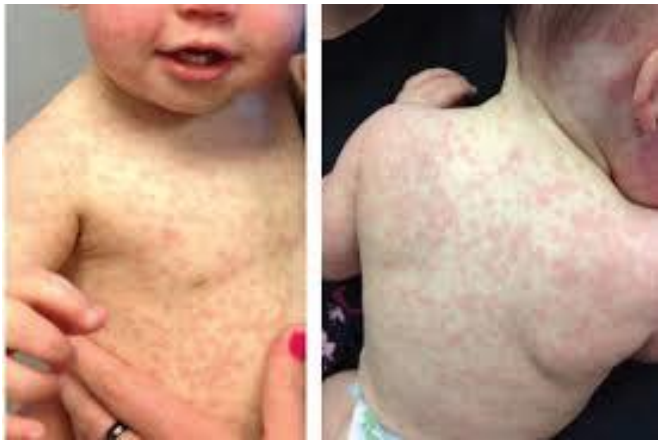
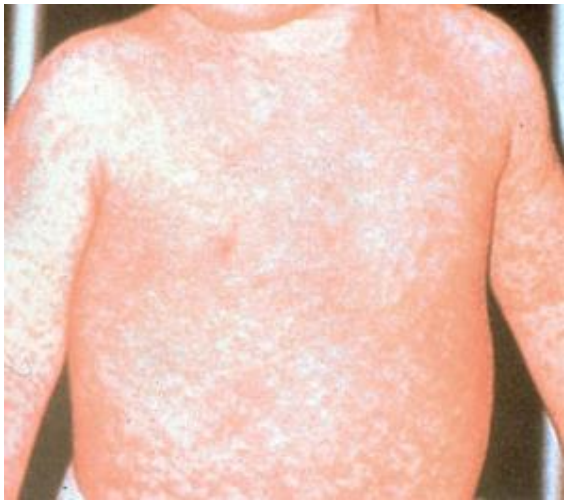
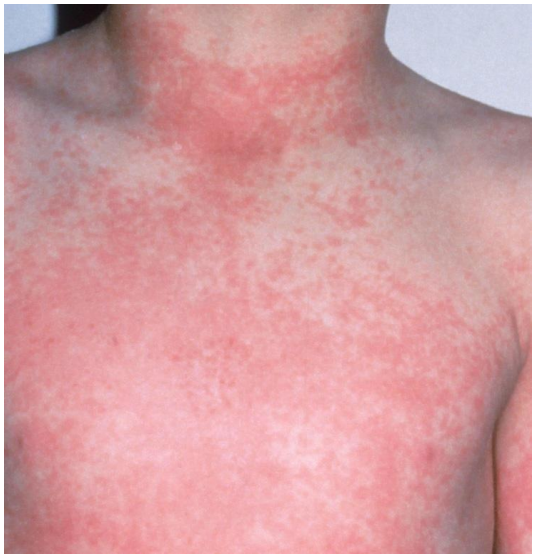
Could this be measles?



Amoxicillin
Allergy Rash



Measles Rash



Strep Rash

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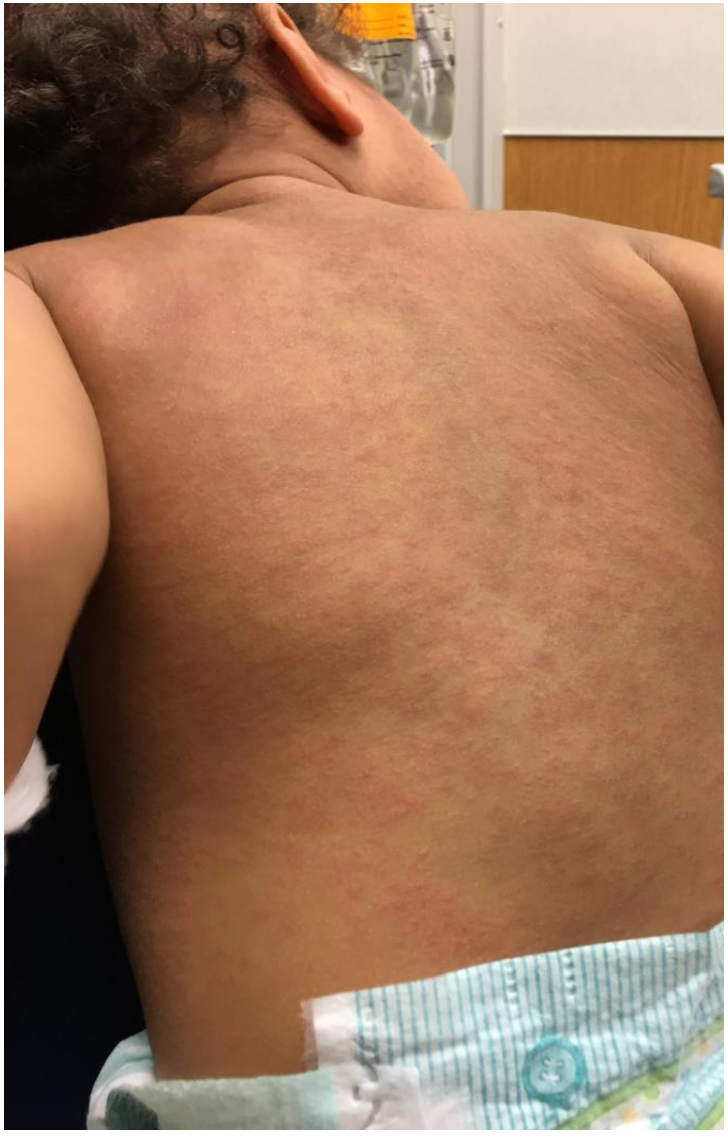
Fever, the 3 C's and Rash--



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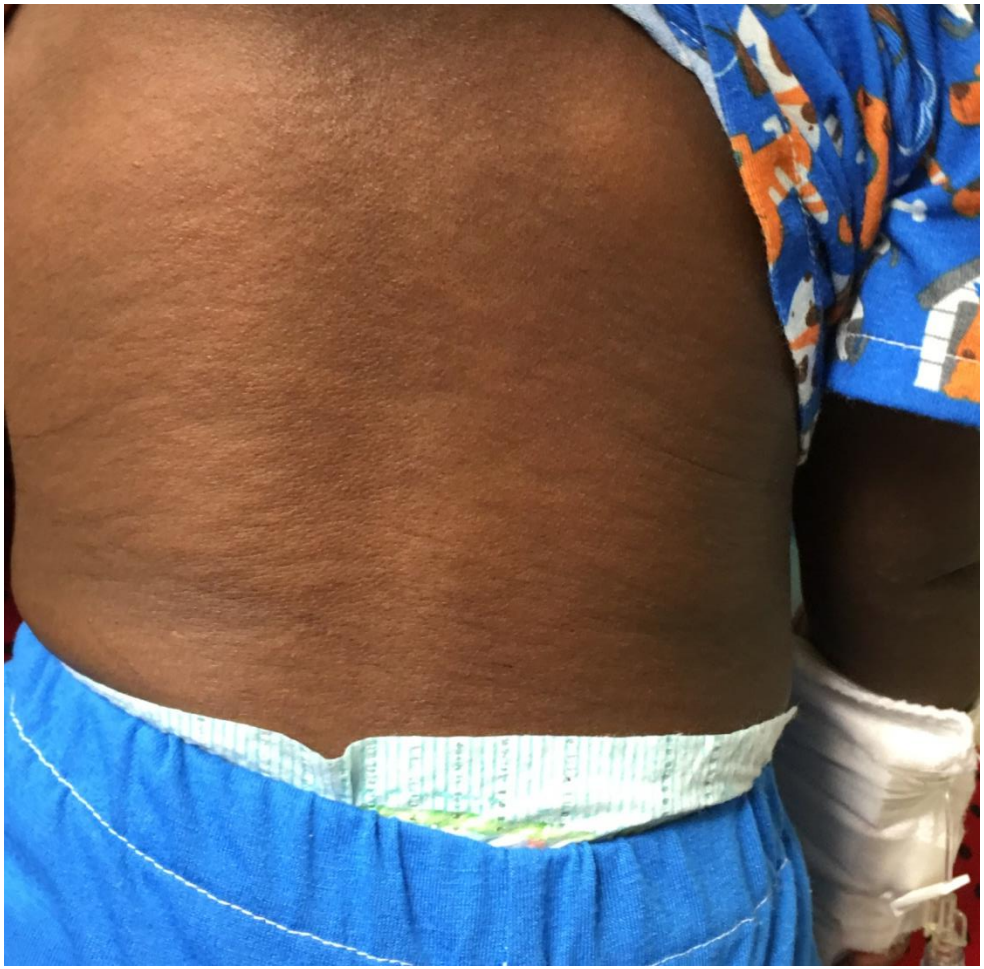
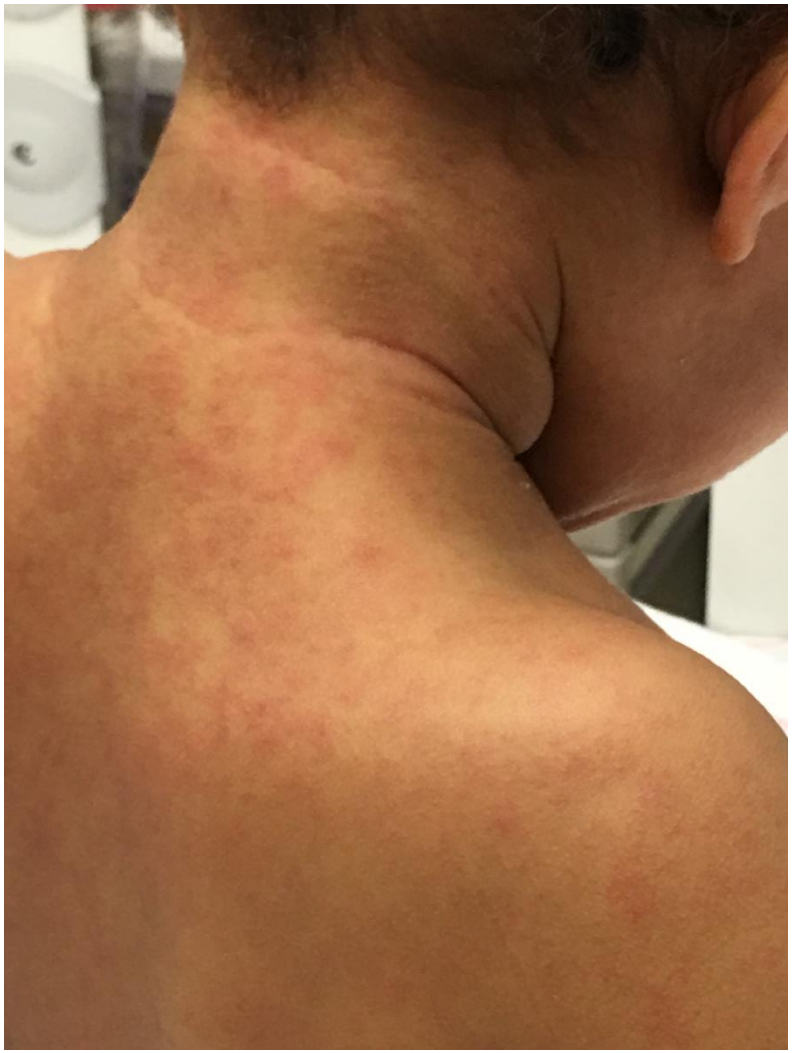
Measles Rash





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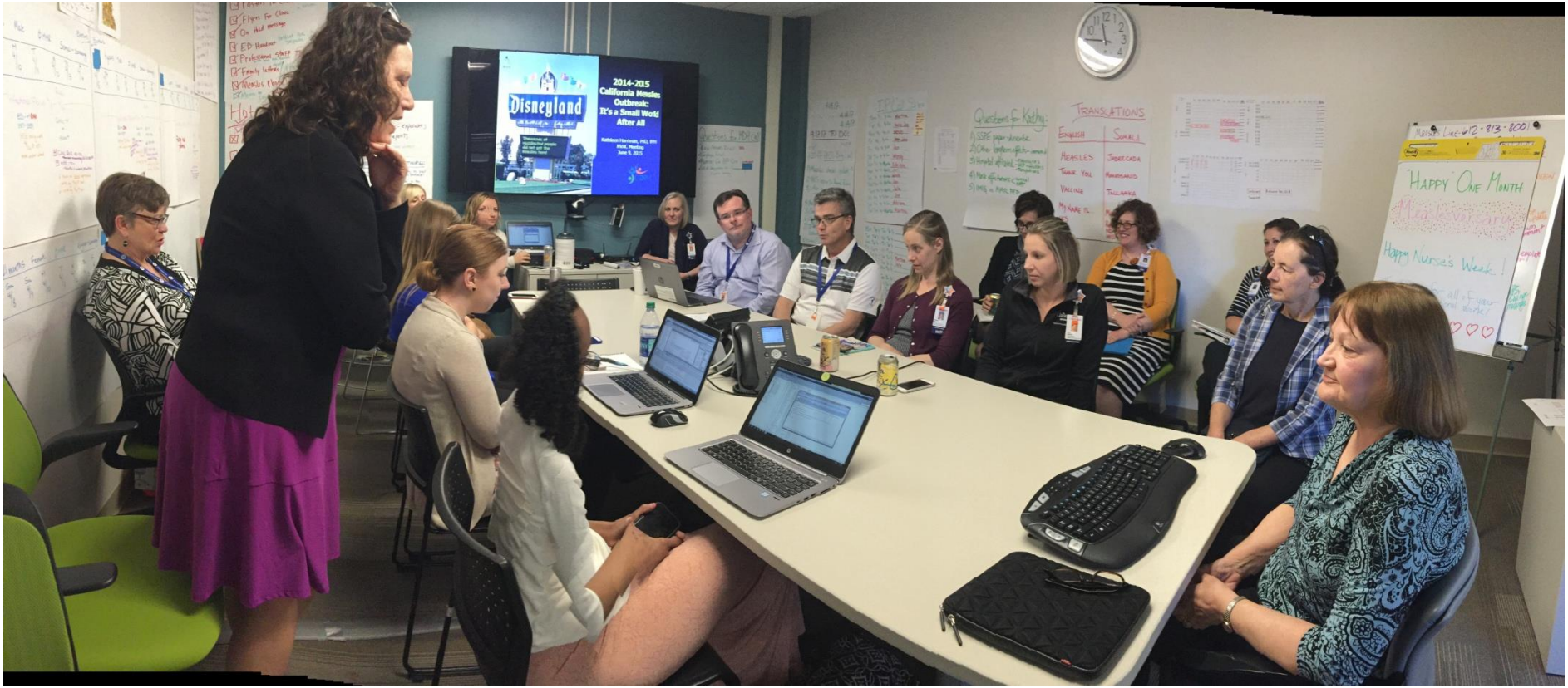
Measles Inpatients--Clinical Picture

- Miserable, lethargic, listless
- Oropharyngeal erythema, mouth sores, dysphagia, Koplik spots
- Dehydrated, admitted for IVF
- Febrile, fever control
- Otitis Media, strep, pneumonia need for oral or IV antibiotics
- Atelectasis, oxygen
- Viral co-infections

- ***Last night was a nightmare in seeing my kids so helpless puking, can't sleep, fever, crying, not drinking, not even able to cry tears…***

Implemented HICS System Day 1- Ramp up, ramp down as needed



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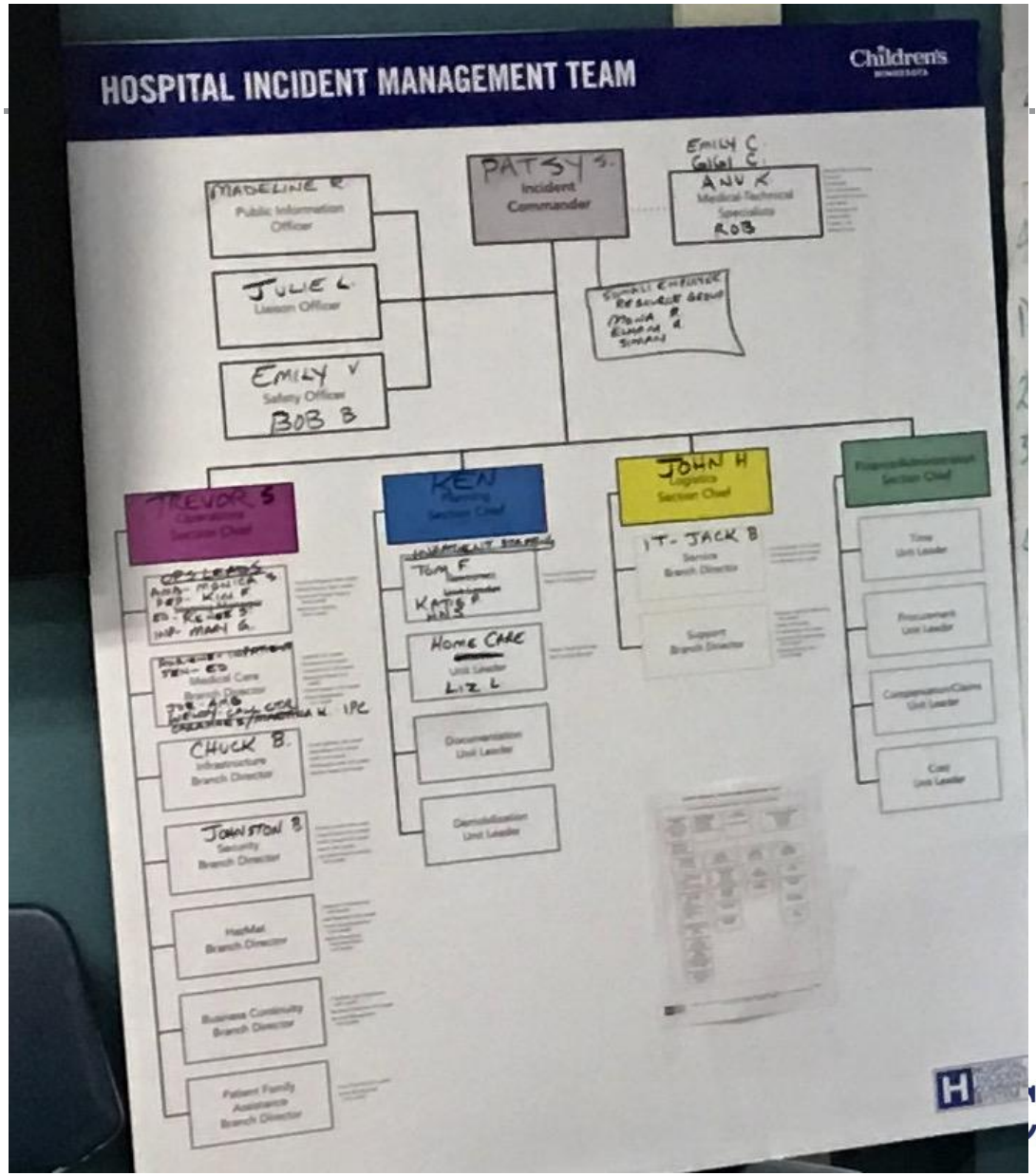
Hospital Incident Command System-HICS



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Measles Cases
Children's Minnesota 2011

- March Outbreak – cared for 12 of the 21 cases
- August Outbreak – cared for index case who survived 15 days on a ventilator in PICU.

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How does HICS help in a Measles outbreak?

- ✓ Adds organization to a chaotic situation
- ✓ Clarifies leadership structure
- ✓ Fosters clear communication, internally and externally
- ✓ Ensures event documentation
- ✓ Fully engages responders
- ✓ Allows clinicians to be clinicians
- ✓ Garners internal resources quickly
- ✓ Sets as an organizational priority
- ✓ Defines clear accountability
- ✓ Declares “this is not business as usual people!”

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Measles – Outbreak Status

State:

- 79 total cases
  - 70 in Hennepin County
  - 73 confirmed unvaccinated
  - 74 in children
  - 65 Somali Minnesotan

Children's:

- 42 tested at Children's
- 53 cared for at Children's
  - Median age 3 yrs (range 10 mos-14 yrs)
- **21 children hospitalized** 100% at Children's
  - One child re-hospitalized for pneumonia for 22 hospitalizations
  - Average length of stay 4 days (range 2 d-17 d)

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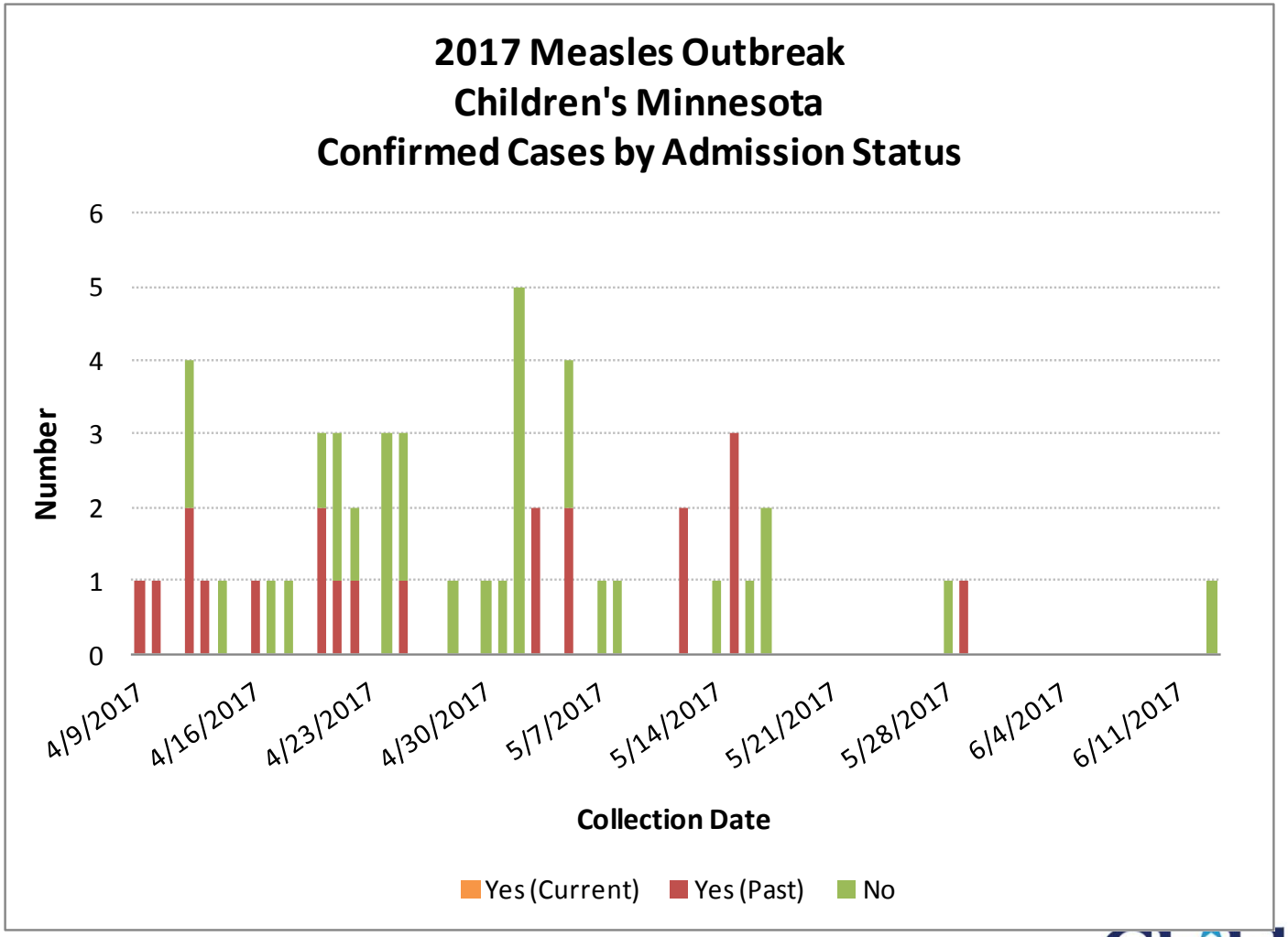
Measles – Confirmed Cases



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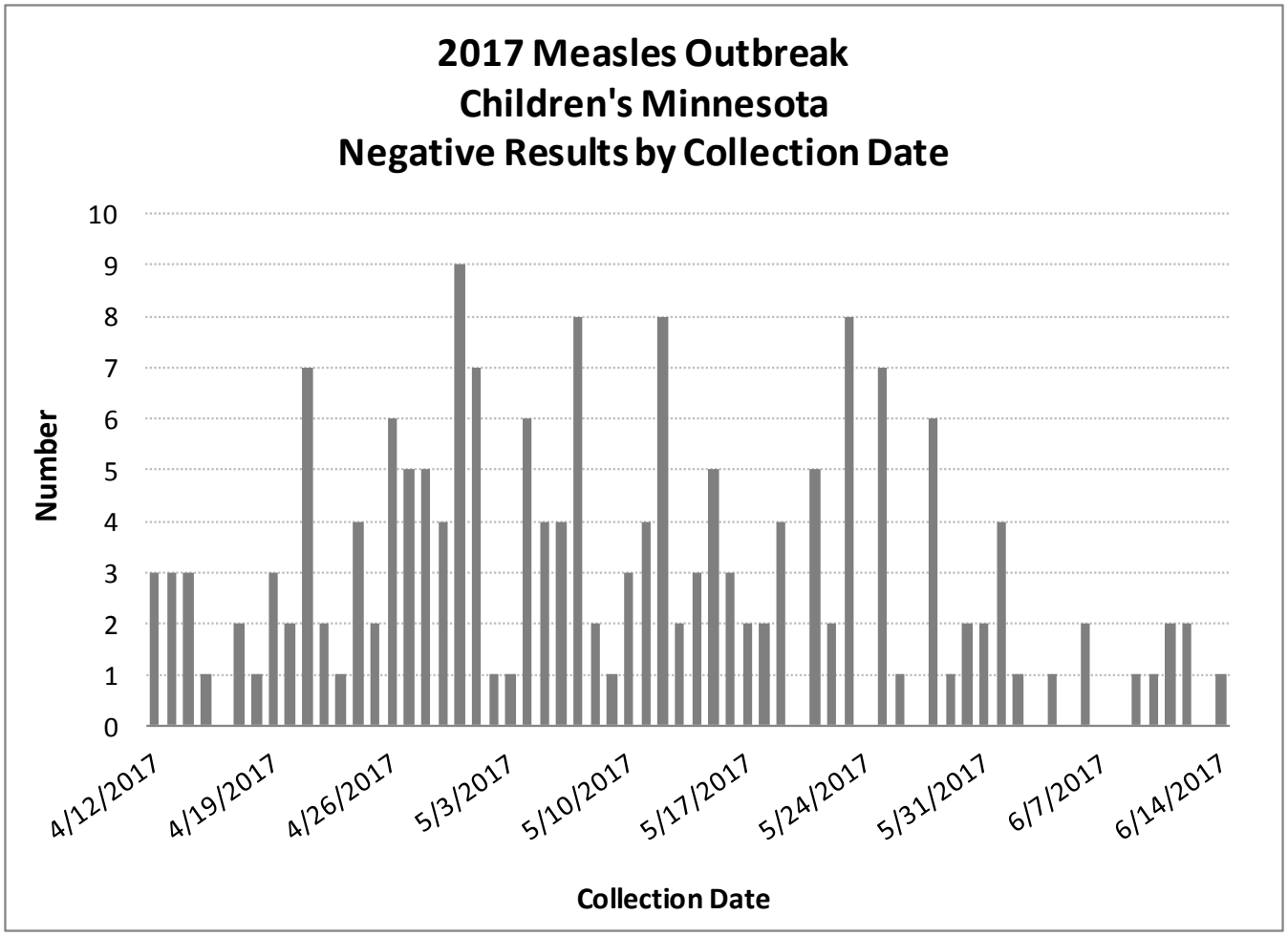
Measles – Ruled Out Cases



- 181 tested and ruled out

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Statewide Measles – Exposures

State:

- Healthcare and child care exposure estimate: **8880**

- 6 Schools involved
- 12 Child care centers involved
- 596 Total exclusions associated with outbreak

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Children's Measles – Exposures

Children's:

- 745 pediatric total exposures
  - ED-M (638)
  - Clinic-M (64)
  - 7th-M Med/Surg (20)
  - 7th-M Hem/Onc (23) most received IVIG
- 173 PEP eligible
  - 138 PEP given (80%)
- 489 letters sent

- Just 2 people who were exposed got Measles and both were adults—1 HCW and 1 Mom who thought she had been vaccinated or had disease as a child.

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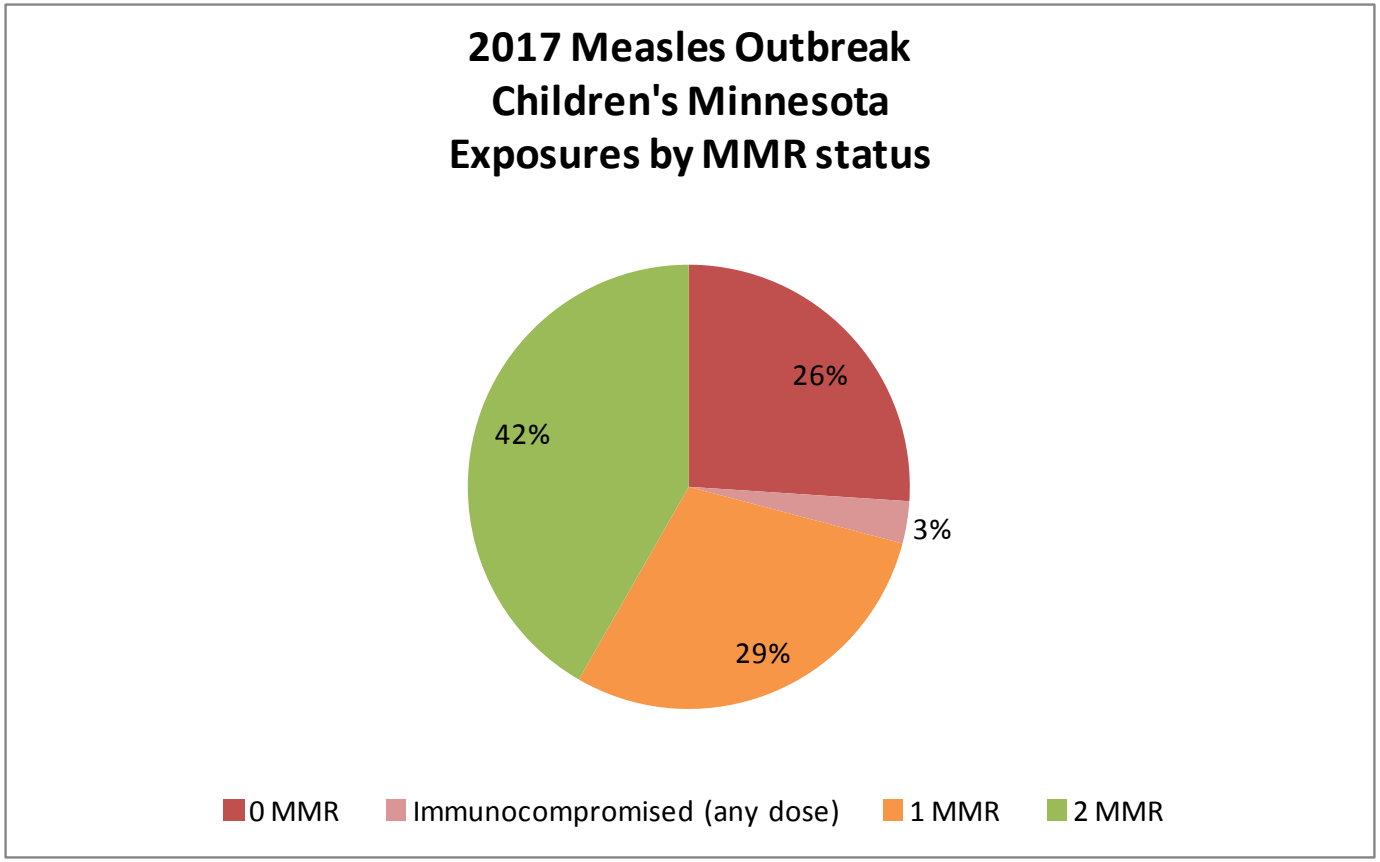
Measles Exposures—Vaccine Status



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Measles Post-Exposure Prophylaxis

MDH Minnesota Department of Health
VACCINE PREVENTABLE DISEASE SECTION

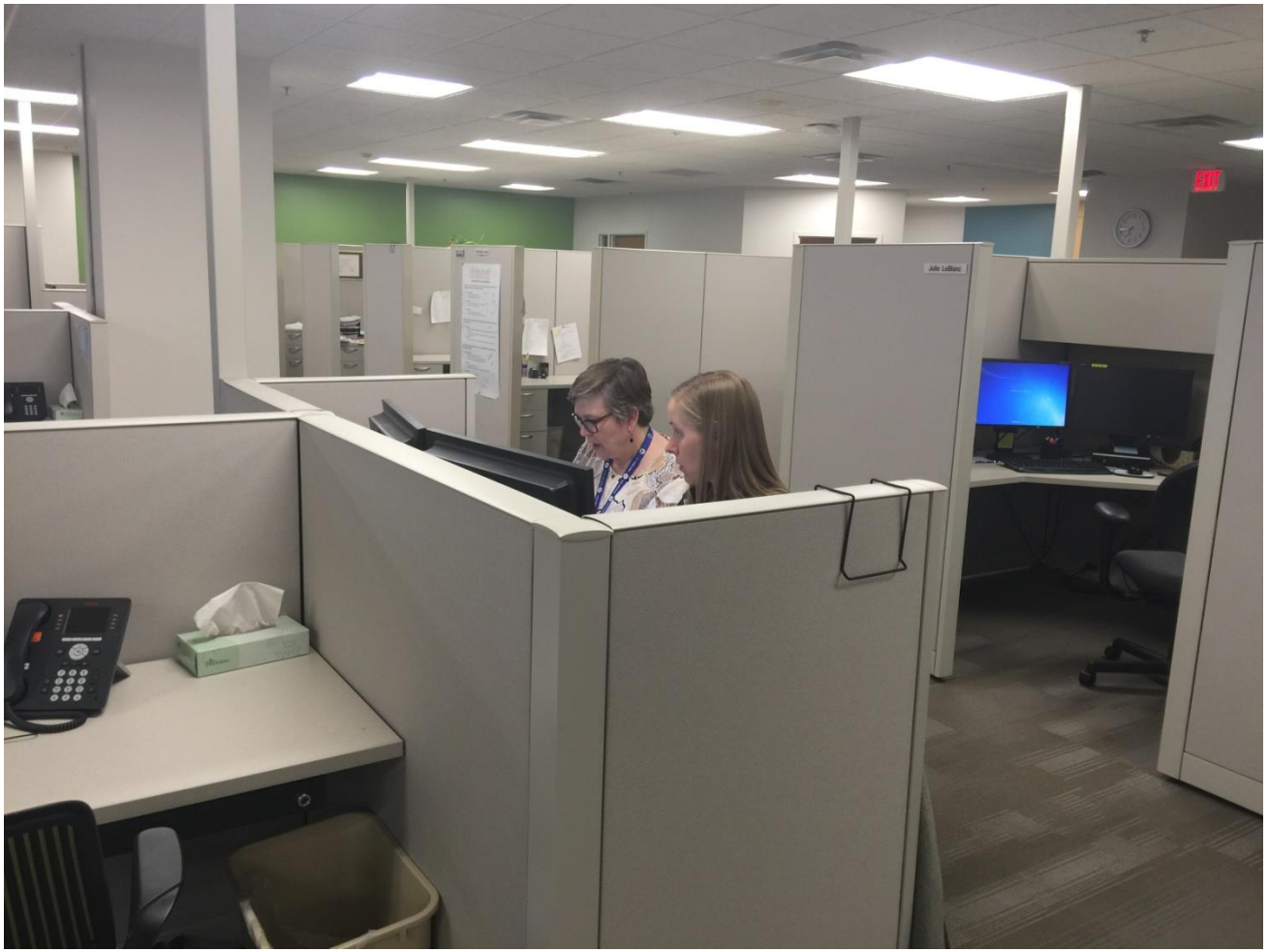
Measles Post-Exposure Prophylaxis for Non-Symptomatic Susceptible Contacts

To determine appropriate post-exposure prophylaxis:

1. Contact MDH at time of visit (651-2014-5414 or toll free 1-877-676-5414).
2. Determine patient's risk factor and identify time from first exposure to measles case.
3. Read the reminders and footnotes for definitions and special considerations.

Risk Factor	Time from first exposure[2]	
	< 72 hours	72 hours through day 6
Infant less than 6 months old	Give intramuscular IG6 (IGIM): 0.5 mL/kg[3]	Give IGIM[6]: 0.5 mL/kg[3]
Infant age 6 through 11 months	Give IGIM[6]: 0.5 mL/kg[3] or Give MMR[6] vaccine	Give IGIM[6]: 0.5 mL/kg[3]
Susceptible[1] pregnant woman	Give intravenous IG[6] (IGIV): 400 mg/kg	Give IGIV[6]: 400 mg/kg
Severely immunocompromised[4]	Give IGIV[6]: 400 mg/kg	Give IGIV[6]: 400 mg/kg
Susceptible close contact over 1 year old[5]	Give MMR[6] vaccine if no contraindications	Give IGIM[6]: 0.5 mL/kg[2] to those <66 pounds (≥66 pounds, see footnote 5)

PEP Plan—Setting up the call bank Time is of the essence



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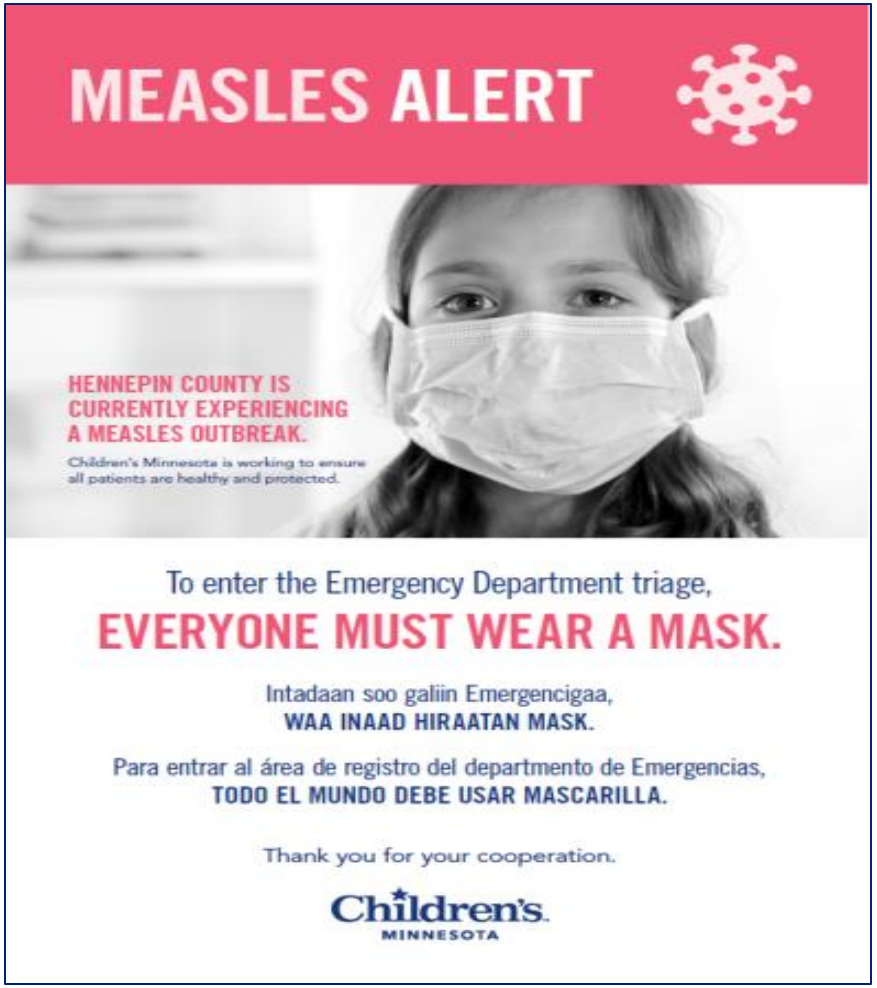
Management of ED patients

- **Pivot nurse** role was instrumental to limiting exposures
- Implemented **universal masking** of all patients/family
- Developed ED screening tool to be more inclusive of patients **without a history of travel**
- Added shortcut to state **vaccine registry** to triage form in EMR, required check at pivot/triage
- **Immediately roomed** patients in AII room that met screening criteria



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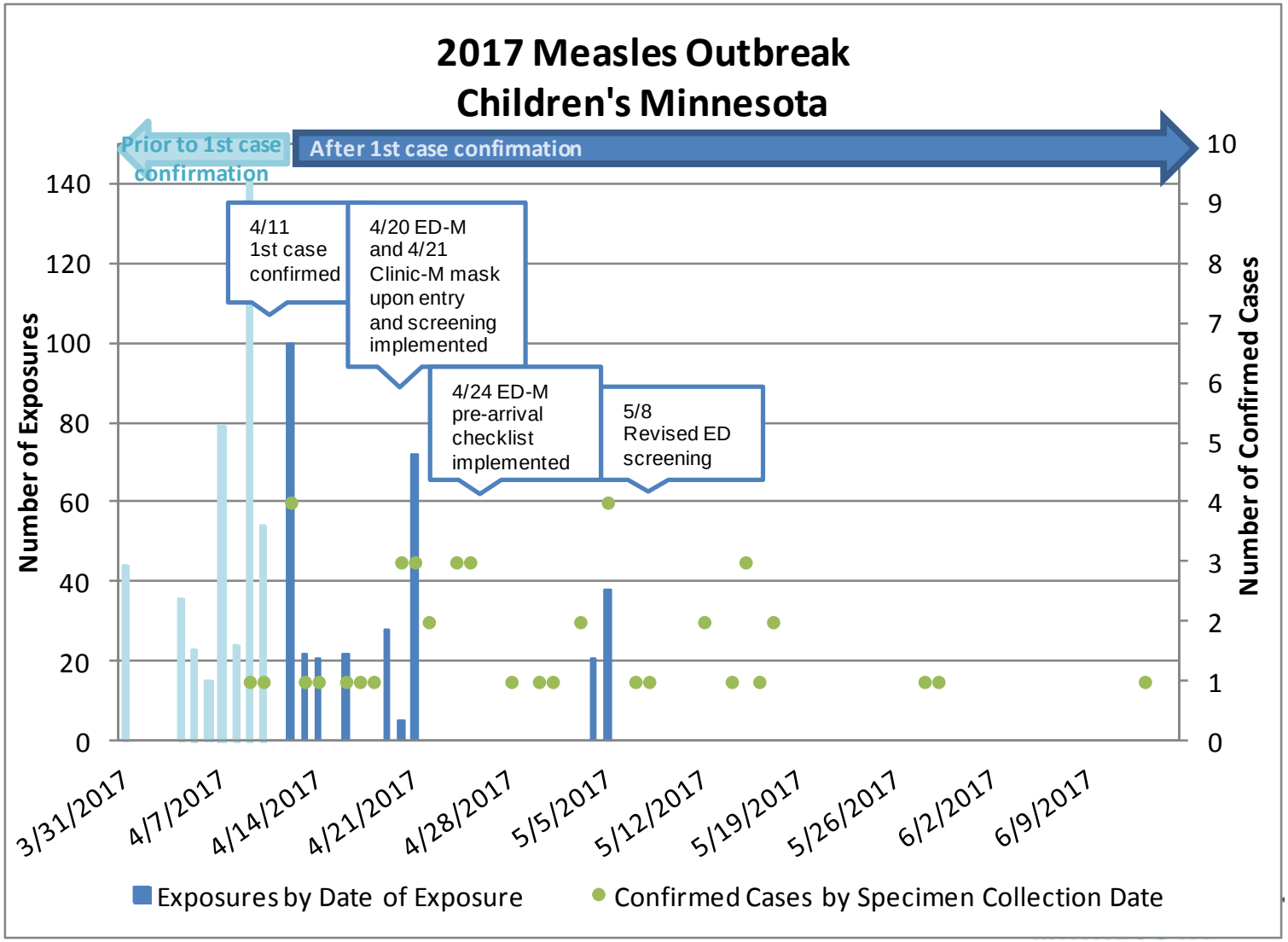
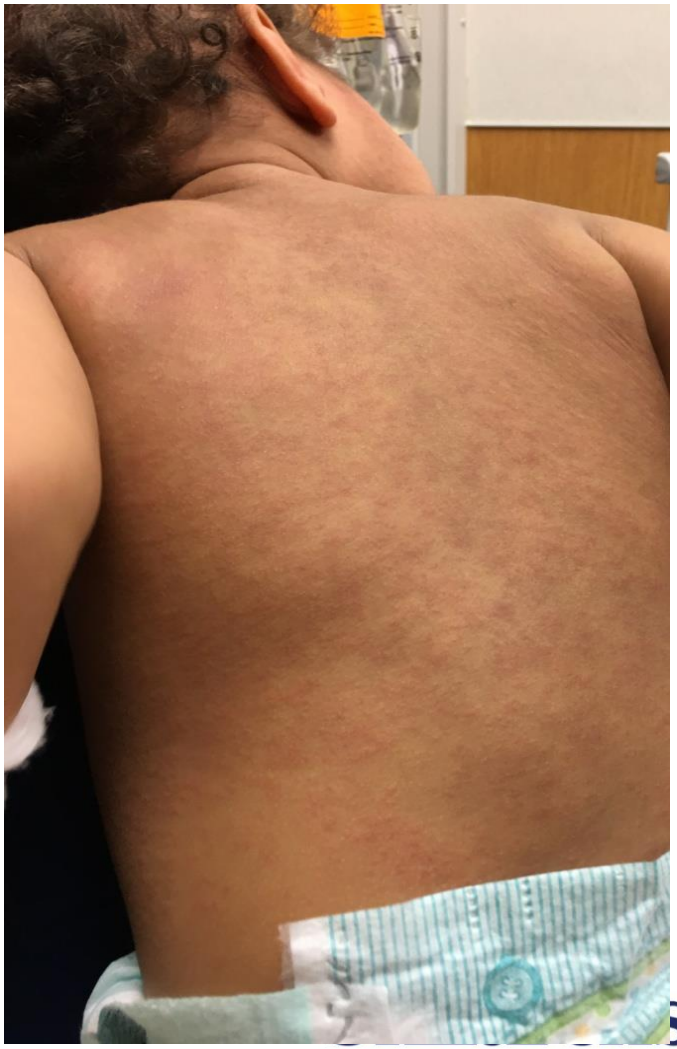
Measles – Exposure Prevention Measures



HICS allows for creativity—Home Care!

- Home care assessment, testing
- “Drive through” throat swab



Employee safety

- Materials management stock up on N95 masks
- Reallocated the PAPR mask carts
- Provided JIT staff education on use of new PAPR mask
- Provided education/information to charge nurses daily
- Increased rounding on the units
- Worked with EHS on staff MMR verification

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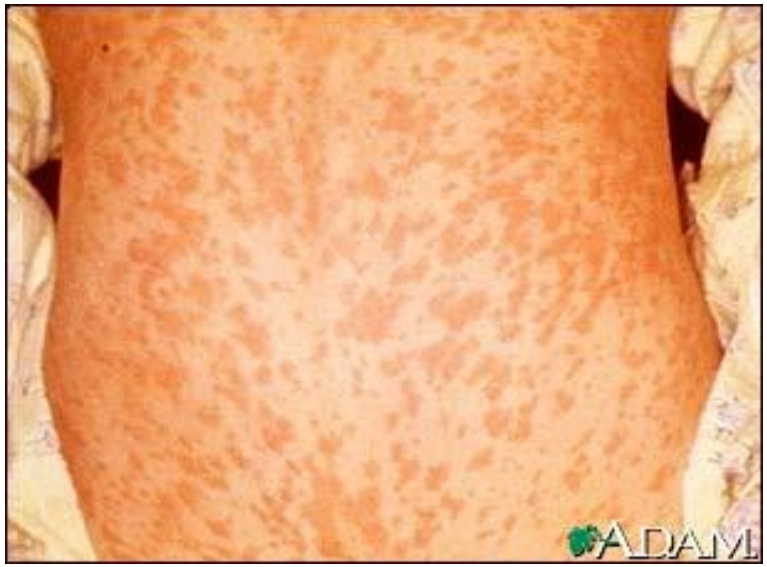
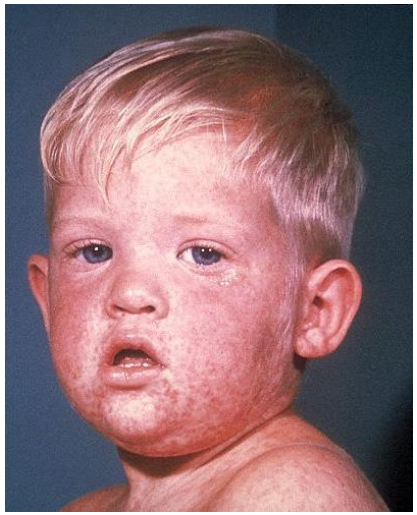
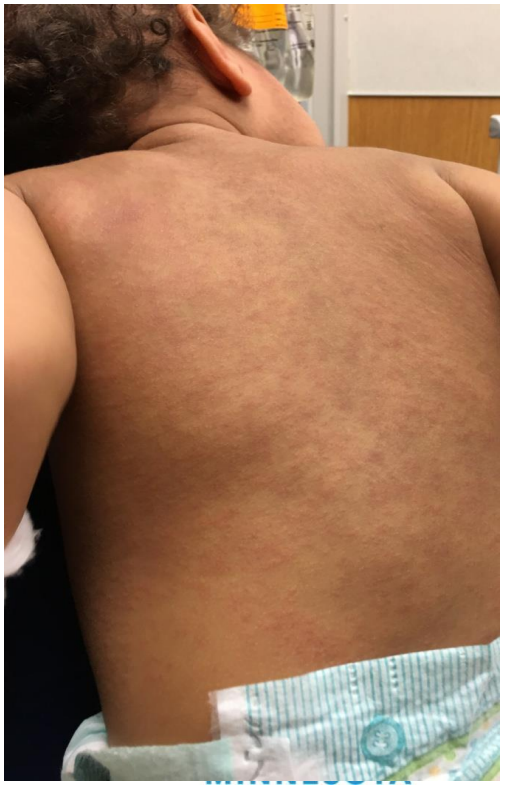
IP Management of Inpatients

- Assessed inpatients daily
- Updated isolation precautions on inpatients as needed
- Worked with bed placement daily
- Provided education/information related to care at home
- Limited visitors to parents/guardians only







Facility management

HICS facilitates quick action

- Created temporary Airborne Infection Isolation (AII) rooms ED and inpatient
- Implemented process to monitor functionality of temporary AII rooms
- Worked collaboratively with materials management to increase the PAR levels of PPE (N95, surgical mask, PAPR hoods)
- Purchased additional portable HEPA filter units for clinic

Temp AII rooms

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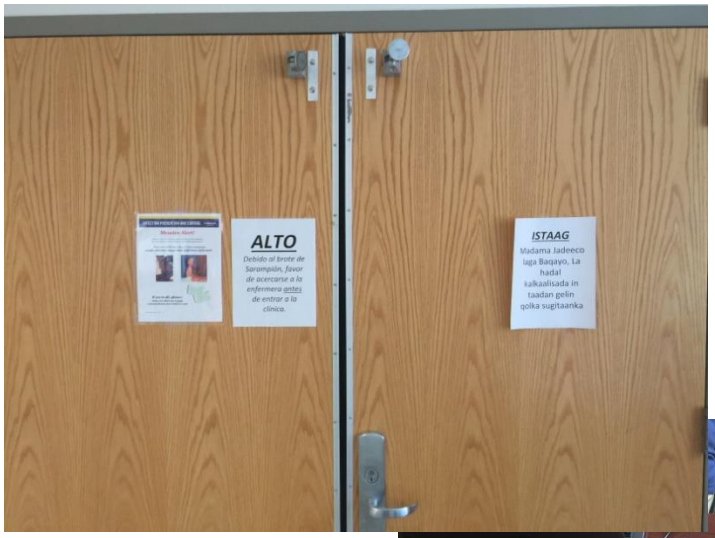
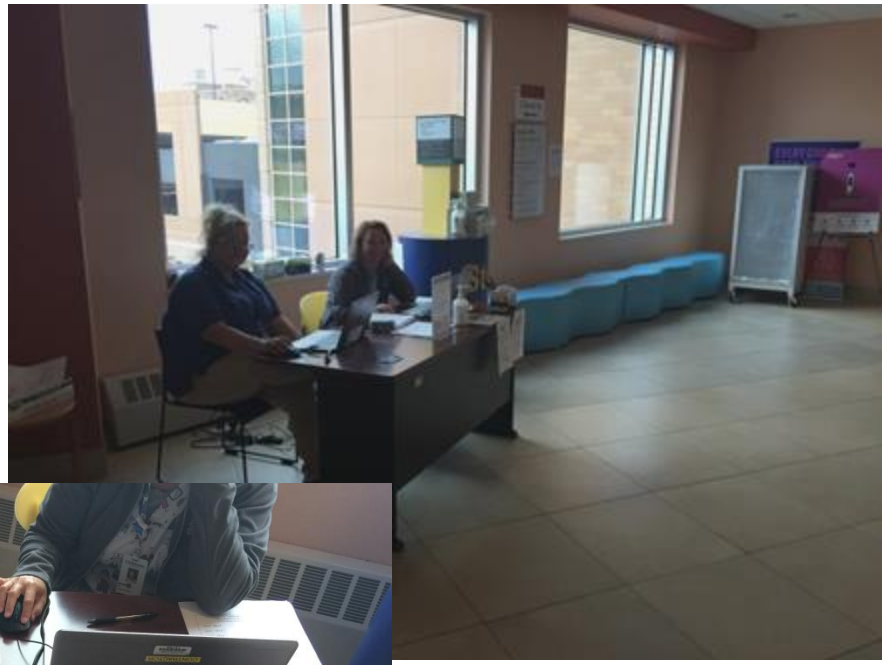
Ambulatory patient management





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Universal Masking Requirement

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MMR Vaccine Increased Uptake

- MDH recommended "accelerated schedule"
  - Dose 1: 12 months of age or older
  - Dose 2: 28 days later (regardless of age)
  - Initially only Somali residents and affected counties
  - Revision clarified option for statewide residents
- MMR Doses Administered at 7 of 12 gen peds clinics in 2017
  - March – 417
  - April – 437
  - May – 2037
- 2016 (May, June July) = 2562. ⬆ 325% to 8324 in 2017
- VFC
  - Monthly average prior to outbreak ~ 3,000
  - Mid-April to mid-May ~ 10,000

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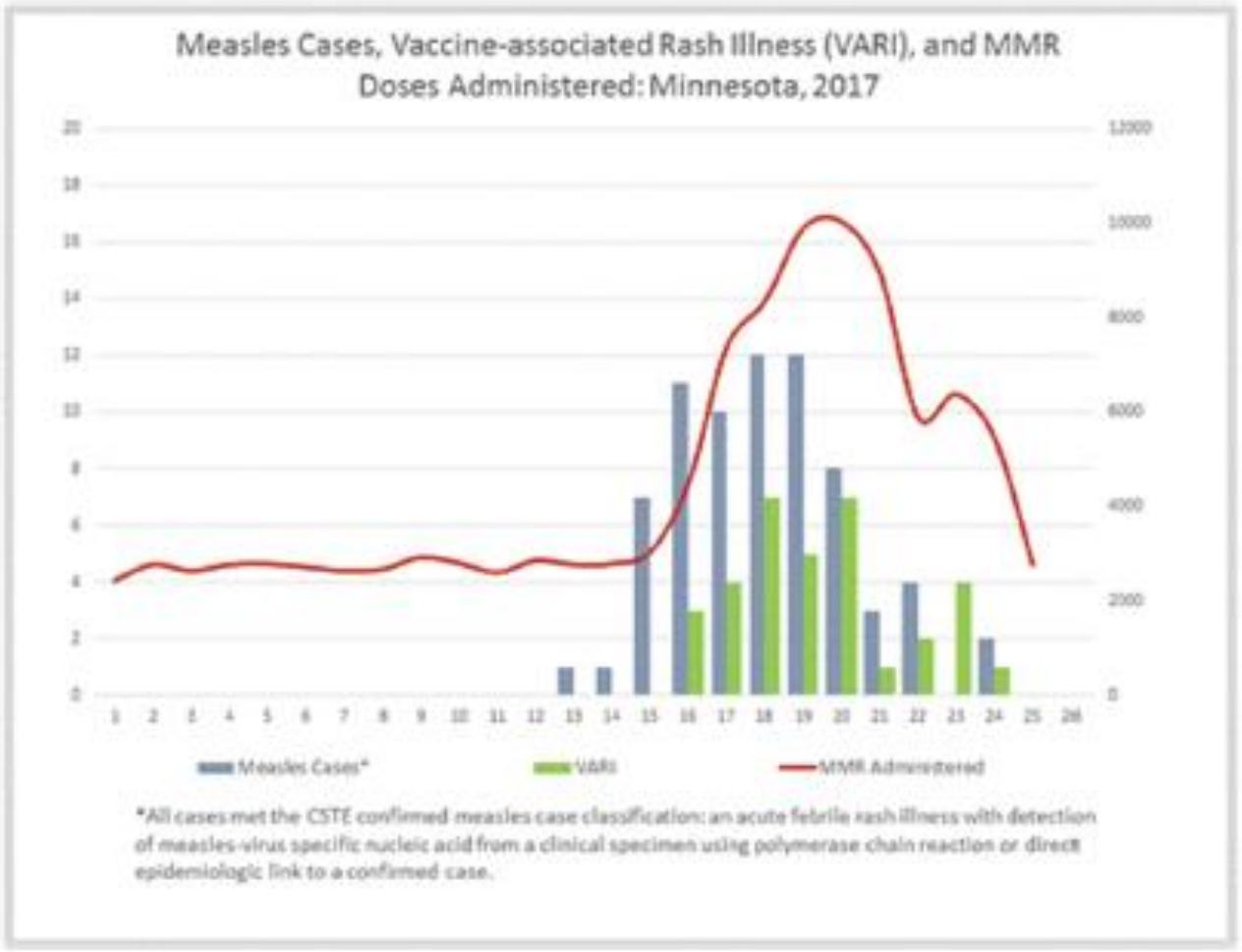
Sorting the Wheat from the Chaff: Vaccine-Associated Rash Illness Occurring Amidst a Large Measles Outbreak—Minnesota, 2017

Karen Martin, MPH; Rajal Mody, MD, MPH,;p Malinini Desilva, MD, MPH et al OFID 2017:4 (Suppl 1)



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Measles Prep Checklist:

1. Do we have a strong relationship with local and state public health?

2. Do we work closely with individuals in public health to call and quickly consult?

3. Does our lab and our state health department have a lab capability to quickly do PCR tests?
   - Is the measles PCR lab order set hard-wired?

4. Is our hospital proficient in using the HICS system and willing to use it for ID outbreak situations?

5. Are our internal communications systems in place so staff know where to go for IP updates? Are those updates quickly accessible and user-friendly?

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Measles Prep Checklist:

6. Can our marketing and communications department dedicate staff to assist with quickly making signage, internal FAQ's, external media responses? Are we pals?

7. Can our ER and clinics recognize measles rash to promptly isolate?

8. Do we have a proper room to isolate them in?
   - If not, is our facilities ready to create an AII room?
   - Do we have enough AII rooms?
   - What is our back up plan?

9. Do we have IT systems to identify individual patients who are in ED waiting rooms, ED pt rooms and inpatient rooms retrospectively?

10. Are potential infectious disease exposure questions part of the ED Triage screening process?
    - Do we have a question that would capture measles exposure?

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Measles Prep Checklist:

11. Does our facility carry a supply of IMIG?
    - If not, do we know how and where to get it quickly? Time is ticking.

12. Do we have a standing order for IMIG post measles exposure in your EMR?

13. Are our HCP's vaccinated with 2 doses of MMR?
    - Is a state registry up?

14. Who would our resources be to call exposed patients?
    - Can we access an interpreter as needed at odd hours?

15. Do we have resources to consider who is a suspect case to assist clinicians in who should be tested?
    - Applying the state established case criteria.

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Measles Prep Checklist:

16. Have we done staff education on transport and care of measles and other highly infectious diseases?
    - Is there a quick reference posted for staff?

17. Is the organization clear about 1 case of measles should be considered an emergency?
    - Are they supportive of providing resources we need when asked?

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Outbreaks are Expensive

- Children's expenses $1.3 Million
- Reimbursable care (mostly MA) $ 1M
- Unreimbursable direct patient care $20 K
- Unreimbursable outbreak response $280 K
- HICS helps track expenses in real time
- Vaccines $282,000
- IG $ 60,000
- Supplies $ 32,000
- RN clinic triage $ 61,000

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Lessons learned

1. Screening questions may not always capture our intent.
2. Measles is not always a textbook presentation but is always a public health emergency.
3. Presentation while infectious but without rash is where most exposures occur, especially prior to first diagnosis
4. Outbreaks change minds
5. Everyday is a new day where an index case can present; ongoing vigilance is in order
6. MMR vaccine for HCP's may not be protective thus N95 mask wearing is in fact important
7. Reviewing immunization status in triage, inpatient is critical medical information
8. HICS is imperative in "non-code orange" situations

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Children's Acknowledgements

- **Infection Prevention and Control Team:**
  - Anu Kalaskar, MD, Medical Liaison
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  - Joseph Kurland, MPH Infection Preventionist
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  - Martina Korinek, MPH, CIC Epidemiologist
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  - Wendy Berg, RN, CIC Infection Preventionist
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  - Emergency Preparedness Manager-Ken Combs
  - Public Information Officer-Madeline Riggs

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Questions

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