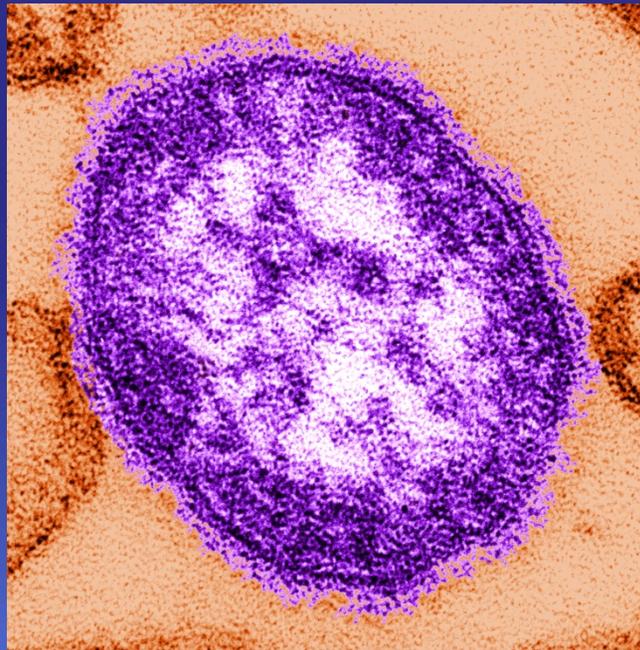


Measles in Minnesota, 2011



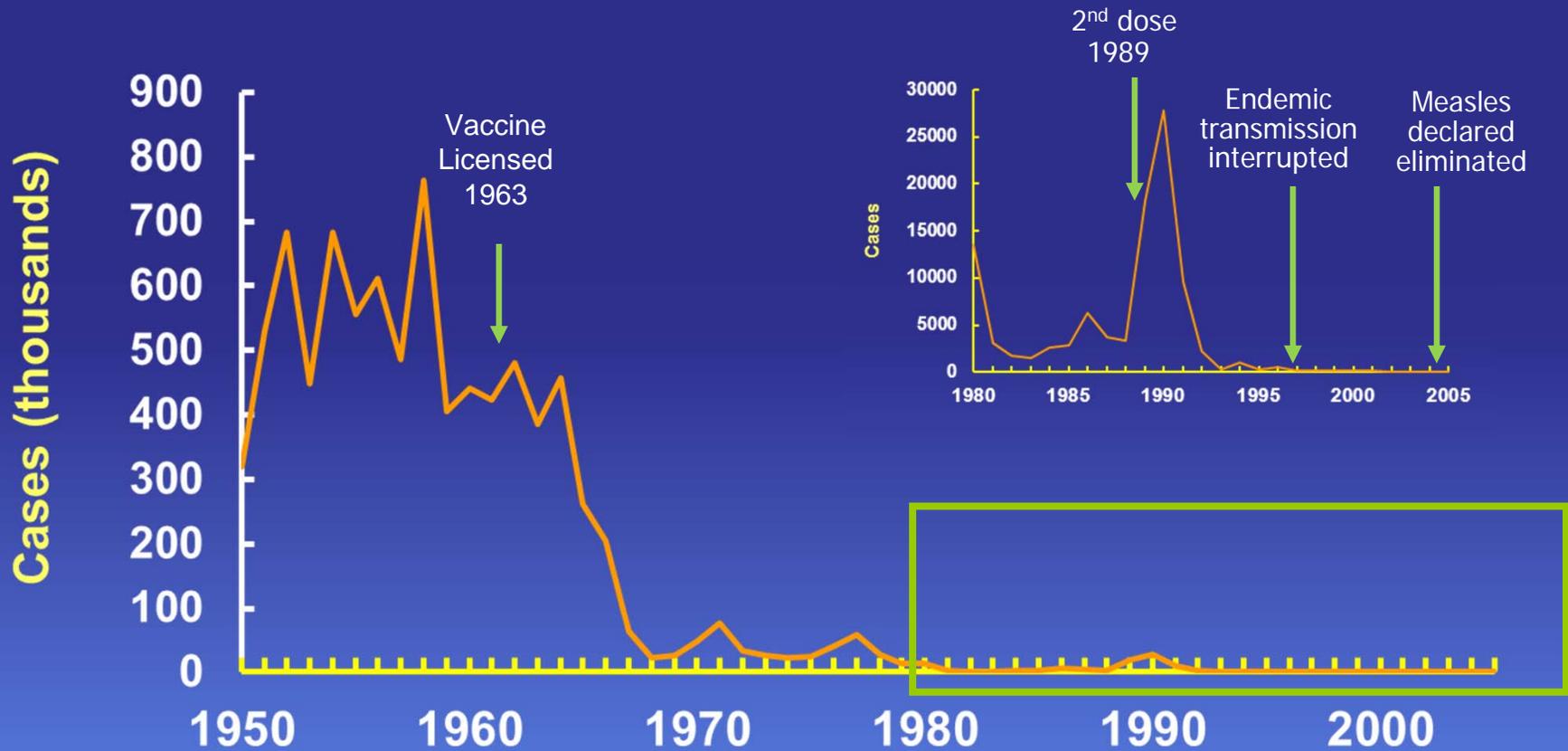
Pam Gahr, MPH
Epidemiologist, Senior
Vaccine Preventable Disease Surveillance Unit
Minnesota Department of Health

Outline

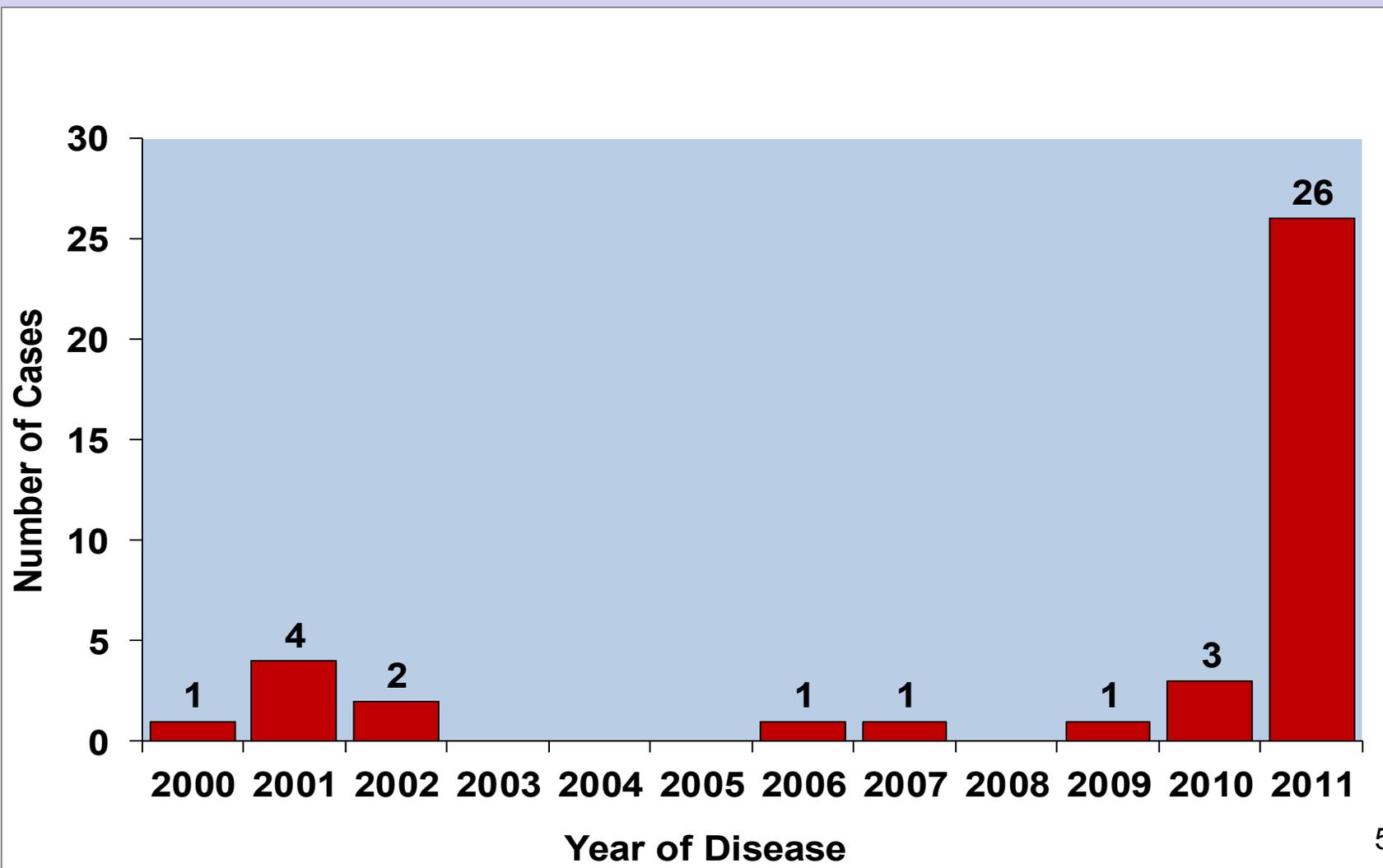
- **Measles Epidemiology**
- **Minnesota Spring Outbreak Summary**
- **Public Health Response**
- **Vaccine Hesitancy in Minnesota**
- **Lessons Learned and Conclusions**

Measles Epidemiology

Measles – United States, 1950-2005



Reported Cases of Measles Minnesota, 2000-2011



United States Measles Cases – 2011 (preliminary data)

- 222 confirmed cases
- 200 (90%) are import-associated
- 192 (86%) unvaccinated or undocumented vaccination status
- 17 outbreaks (≥ 3 cases that are linked in time or place) accounting for 50% of all 222 reported cases

Minnesota Measles Cases – 2011

- 26 confirmed cases
- All import-associated
- 23 (88%) unvaccinated or undocumented vaccine status
- 2 outbreaks (≥ 3 cases that are linked in time or place) accounting for 92% of all 26 reported cases

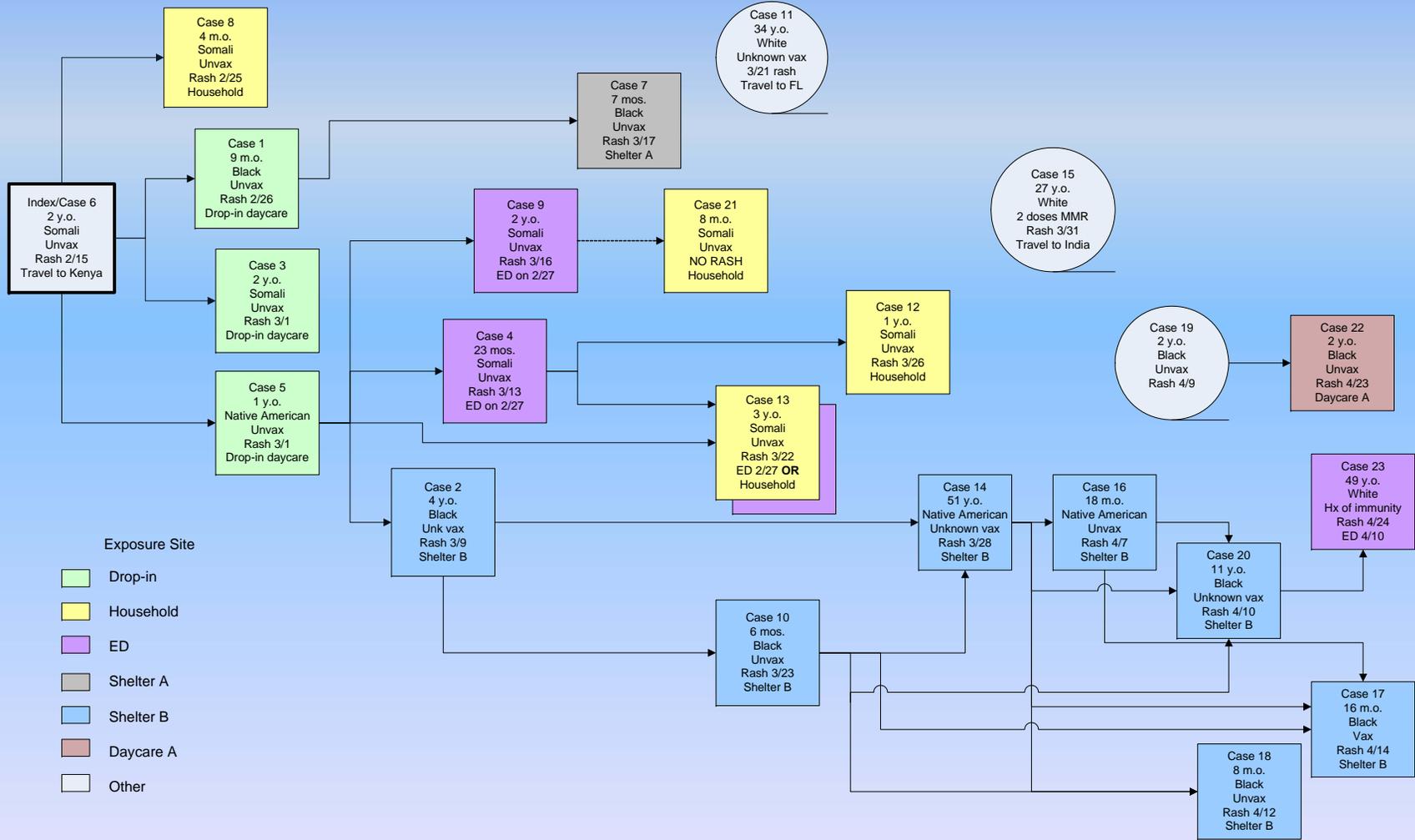
Minnesota Spring Outbreak Summary

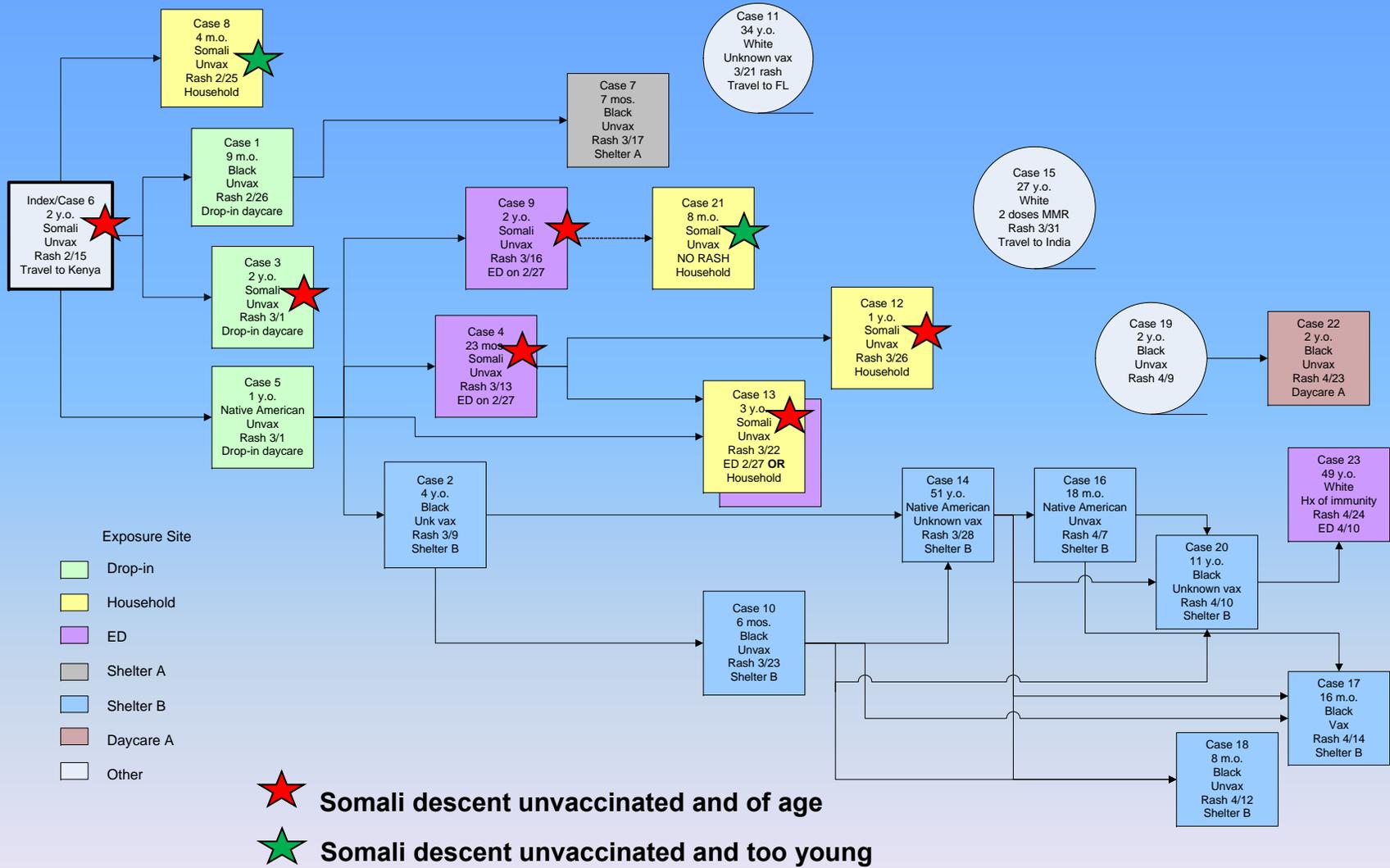
Spring Outbreak Summary – February- April 2011

- **March 2, measles confirmed in a nine-month old infant**
- **Source case found retrospectively, 30 month old, unvaccinated, US born, returning traveler from Kenya – rash onset on February 15**
- **Source case attended drop-in daycare; resulted in four cases including the first identified case**
- **Vaccine hesitancy in Minnesota Somali community coupled with exposures in homeless shelters fueled the outbreak**
- **20 cases linked to the 30 month old (21 total)**

Exposure Settings (n=21)

- Index case acquired infection in Kenya
- Drop-in daycare (3)
- Hospital (3)
- Household (4)
- Congregate living for the homeless (8)
- Daycare (1)
- Unknown (1)





Demographic Characteristics (n=21)

- **Age**
 - range 4 months – 51 years
 - Mean: 6.5 years
 - Median: 1 year
- **Sex**
 - 9/21 (43%) female
 - 12/21 (57%) male
- **Race (descent)**
 - Black (non-Somali) 9 (43%)
 - Black (Somali) 8 (38%)
 - American Indian 3 (14%)
 - White 1 (5%)
- **Shelter resident** – 9 (43%)

Hospitalizations (n=14)

- Hospitalization: 14/21 (67%)
- Average days in hospital: 4 days (range: 2-7 days)
- All 14 had dehydration that required IV fluids
 - 8 (57%) vomiting and 9 (64%) diarrhea
- 2 (14%) pneumonia, 2 (14%) bronchiolitis, 4 (29%) croup, 7 (50%) otitis media
- 3 (21%) reactive airway disease or asthma

Vaccination Status (n=21)

- **Unvaccinated: 16 (76%)**
 - Too young for vaccination: 7/16 (44%)
 - Of age but not vaccinated: 9/16 (56%)
- **Vaccinated prior to recommended age: 1**
- **Unknown vaccine status: 4**

Somali Descent Vaccination Status (n=8)

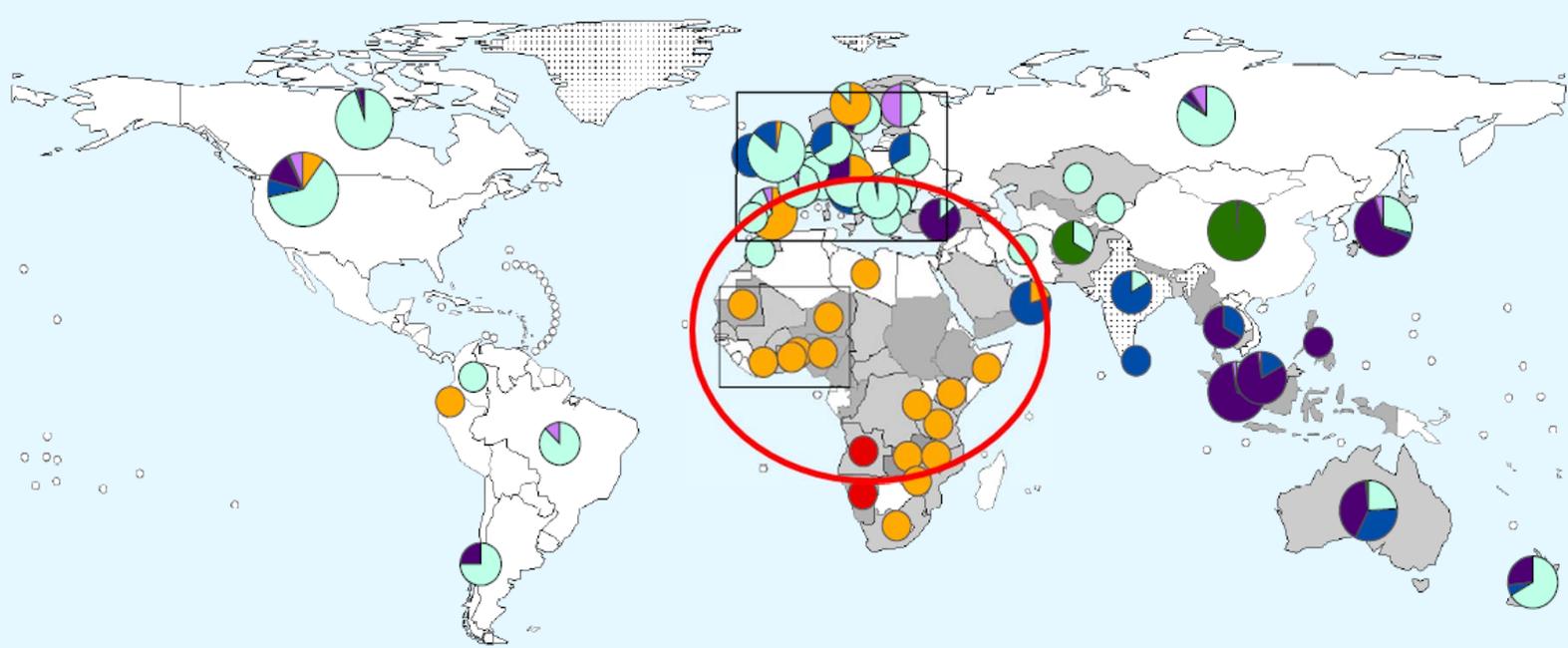
- Somali descent 8/21 (38%)
- All 8 were unvaccinated

- Too young for vaccination: 2
- Of age but not vaccinated: 6

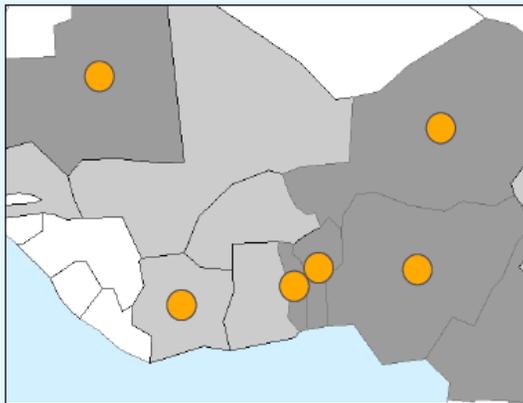
Laboratory Confirmation and Genotyping (n=21)

- **Confirmed at MDH PHL: 19**
 - Measles IgM positive 11/19 (58%)
 - PCR positive 19/19 (100%)
- **Epi-linked and met clinical case definition: 2**
- **Genotyping at CDC and MDH-PHL revealed index case and linked cases are B3, endemic in sub-Saharan Africa**

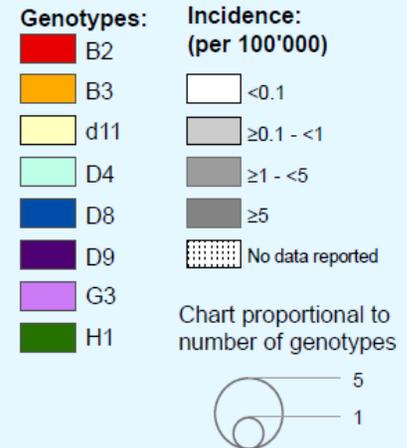
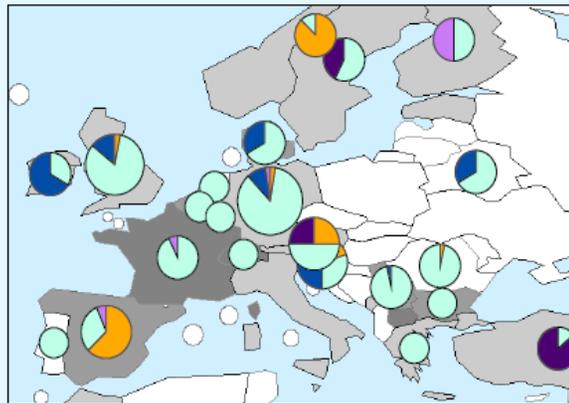
Distribution of measles genotypes, 2011. Data as of 7 December 2011



West Africa inset



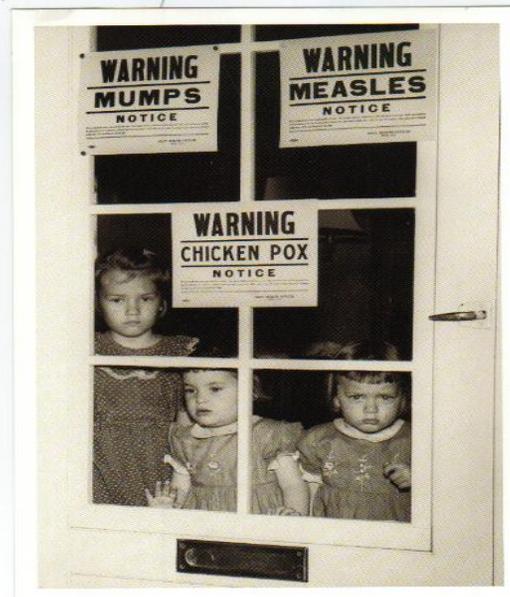
West Europe



Acknowledgement: WHO Measles LabNet.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
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Public Health Response



Case Identification

- **Clinical presentation:**
 - **RASH:** generalized and progressed from head to trunk and extremities
 - **FEVER:** temperature $\geq 101^{\circ}\text{F}$ or 38.3°C ; and
 - **THREE Cs:** cough, coryza, or conjunctivitis
- **Exposure information:**
 - **TRAVEL:** International travelers (including transit through an international airport) or exposure to an international traveler 3 weeks prior to symptom onset
 - **LINKED:** Epidemiologic linkage to a confirmed measles case
- **Immune status:**
 - **Susceptible:** no or unknown vaccination or disease history and born after 1957

Immunity and Exposure Assessment

- Home
- Healthcare facility
- School and childcare
- Other possible exposures unique to outbreak
 - Shelter?
 - Public transportation?
 - Recent travel? Any air or mass transit travel?
 - Visitors in home?
 - Faith-based activities?
 - Other places visited while infectious?

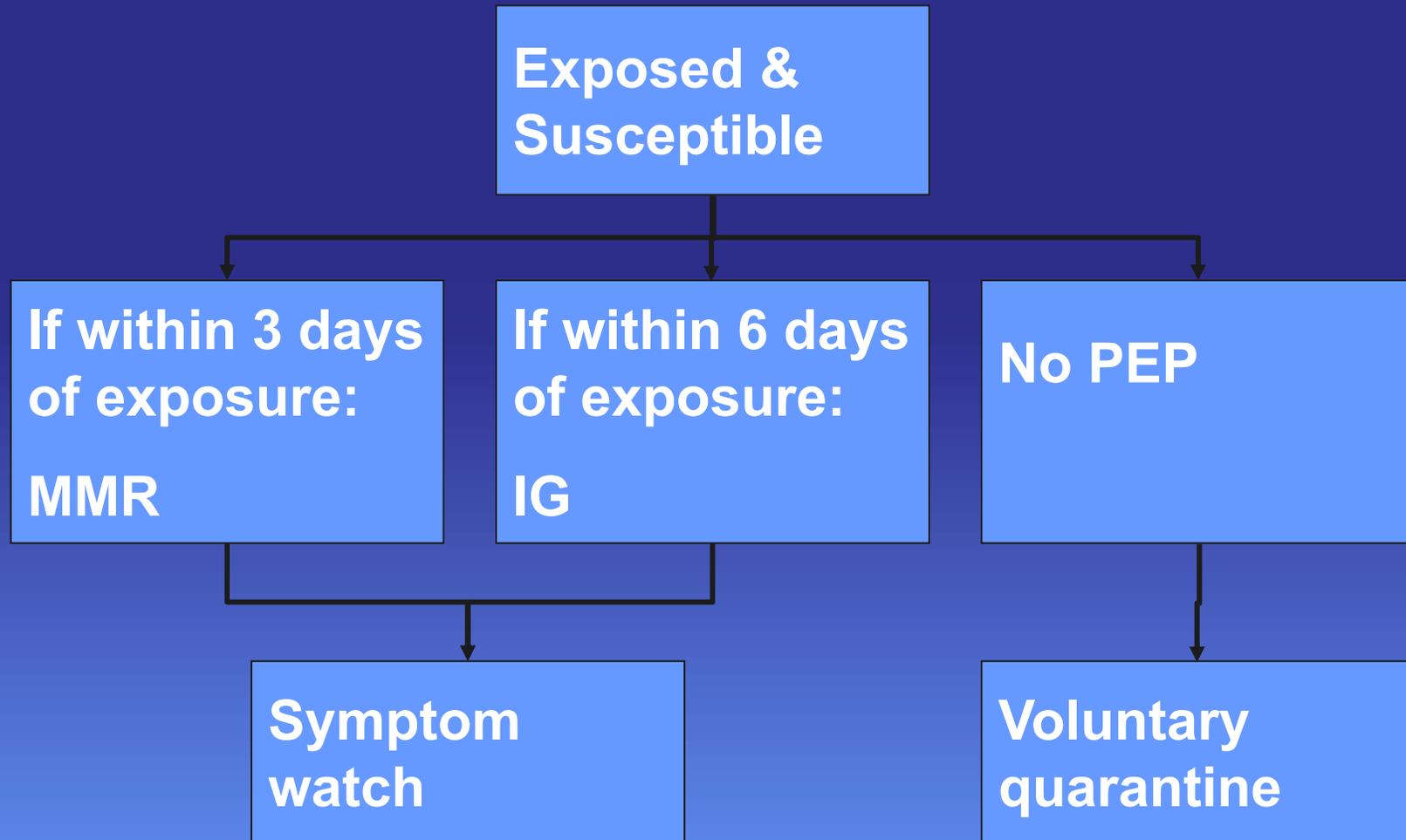
Immunity and Exposure Assessment – Border States

- Out-of-state exposures were communicated via phone and fax to: IA, ND, SD and WI during the outbreak
- Each state used their own protocol of follow-up
- No formal report on outcomes was requested
- No national border situations

Vaccination and Immune Status Assessment Tools

- Minnesota Immunization Information Connection (MIIC)
- Immunity checks – testing at the MDH-PHL (measles specific IgG antibody testing)
- Documentation of MMR from medical records, schools, other state health departments
- Refugee health access to CDC's Electronic Disease Network (EDN)
- IOM documents that refugees carry on person

Public Health Response: Contacts Flow Chart



Isolation, Quarantine and Symptom Watch

- Isolate 4 days before through 4 days after rash
- Quarantine or symptom watch* for susceptible contacts (21 days past exposure)

**Symptom watch used for those who had unknown immunity or received PEP but was not initiated until after first outbreak*

Voluntary Quarantine Protocol

- **“Day Zero Call”**
 - **Assess exposure + susceptibility of household contacts**
 - **Explain measles symptoms and give instructions for seeking medical attention**
 - **Monitoring calls every 3 days**

Voluntary Quarantine Protocol (cont.)

- **Local public health department (LPH) notified**
- **LPH asked to provide essential services if needed**
 - **No requests for essential services**
- **24/7 contact number for MDH or LPH provided**

Symptom Watch Protocol

- “Day Zero Call”
 - Assess exposure + susceptibility of household contacts
 - Explain measles symptoms and give instructions for seeking medical attention
 - Monitoring calls every 3 days
 - ***NO RESTRICTIONS PLACED ON ACTIVITIES***

Post-exposure Prophylaxis and Summary

- MMR within 3 days of exposure
- IG within 6 days of exposure
- Spring outbreak: 76 IG doses, 3 MMR
- August outbreak: 20 IG doses, 0 MMR

Spring Outbreak Exposure Summary

- 3,009 exposed over 10 weeks
- Median exposures per case = 45 (range 0-564)
- Exposure count affected by congregate settings (same people exposed multiple times but counted once)
- Three placed in quarantine with monitoring; no significant outcomes

August Outbreak Exposure Summary

- 3 cases and 160 exposures
- 28 susceptible contacts identified
- 20 placed in symptom watch (received IG); 4 tested and 1 confirmed measles case
- 8 placed in voluntary quarantine

Outbreak Vaccination Recommendations

Vaccination recommendations

- Children 6-11 months living in affected congregate living facilities receive 1 dose of MMR
- Children in Hennepin County and those of Somali descent receive “early” 2nd dose of MMR* (Somali descent recommendation was omitted in April)
- Nine community vaccination and IG clinics held

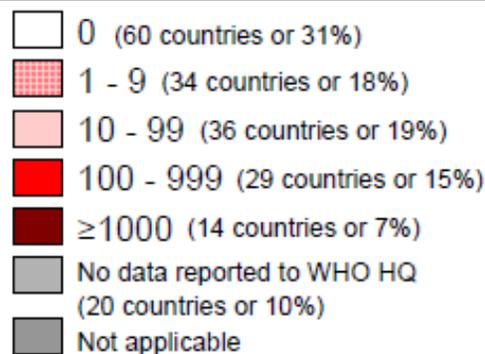
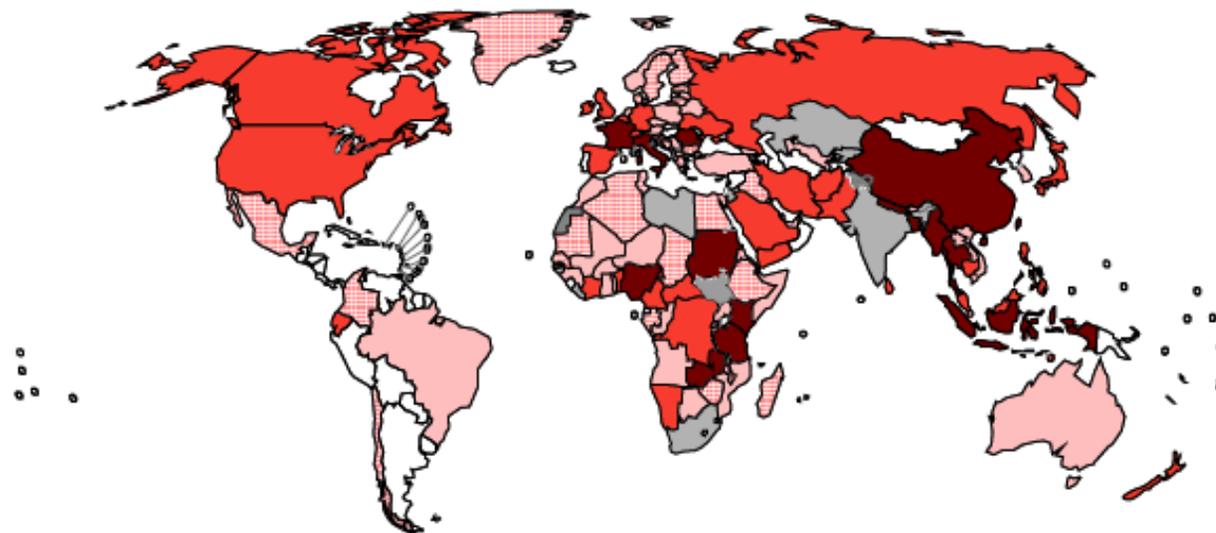
*MMR vaccine is not a booster, therefore, this recommendation does not alter the schedule.

Current Immunization Recommendations

- **Assess MMR at every visit**
- **Offer MMR to those who will be traveling internationally**
- **Offer an early dose of MMR vaccine to children 6-12 months of age who will be traveling internationally**

Global Measles Cases Cont.

Number of Reported Measles Cases with onset date from June to Dec 2011



Data source: surveillance DEF file

Map production: Immunization Vaccines and Biologicals, (IVB), World Health Organization

Data in HQ as of 11 January 2012

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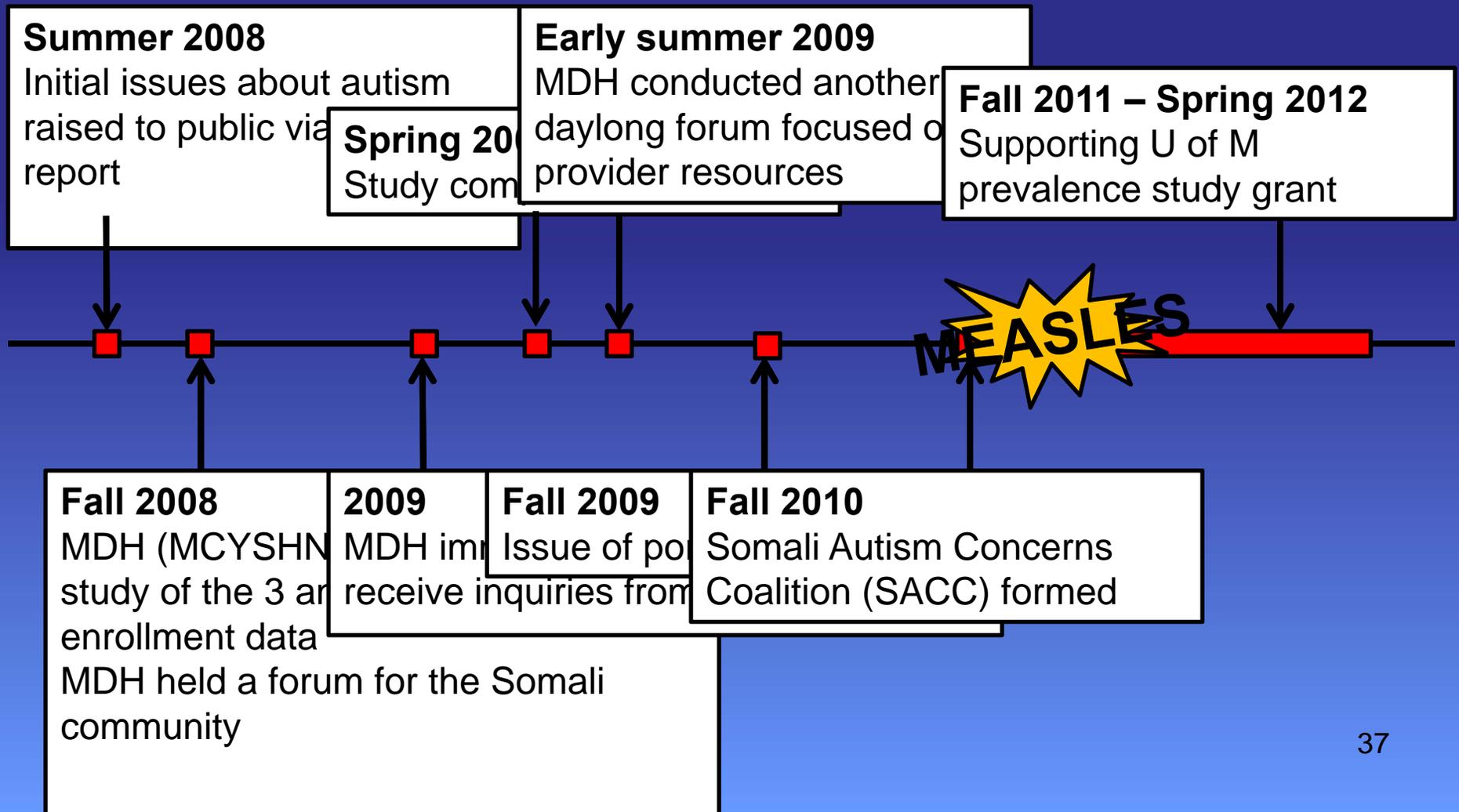
MMR Vaccine Hesitancy in Minnesota



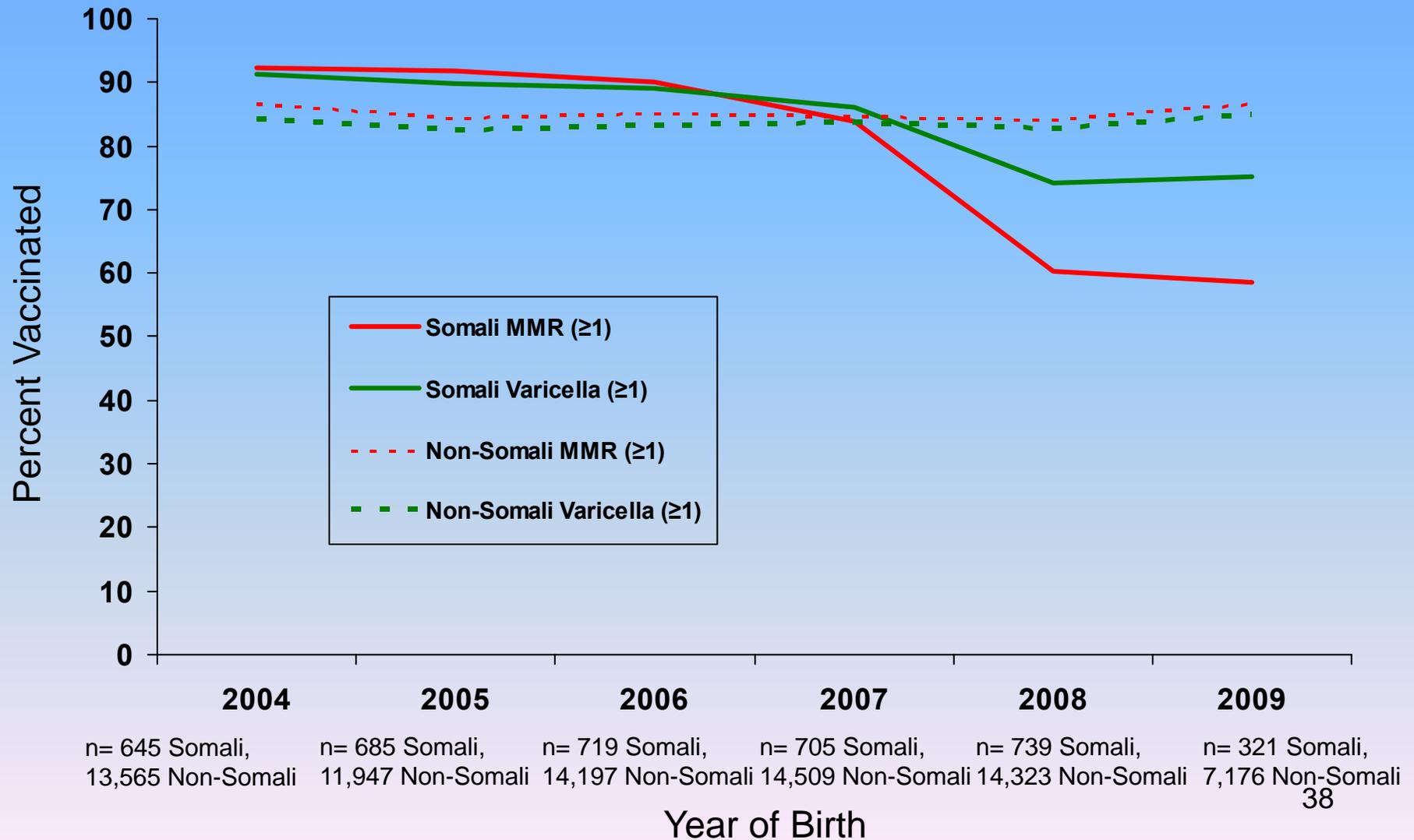
Parents Wonder: Is it Safe to **Vaccinate?**

Many families of autistic kids blame the MMR shot for the disorder. Experts say they shouldn't.

Autism and MMR in the Somali Community



Comparison of 24 Month Old Children Born in Minnesota of Somali Descent and Non-Somali Descent; MMR vs. Varicella Vaccinations in Hennepin County, Minnesota



Lessons Learned and Conclusions

Lessons Learned

- **PCR critical to rapid identification of cases and exposure follow-up**
- **Genotyping useful tool for vaccine-associated cases**
- **Minnesota Immunization Information Connection (MIIC) useful in identifying susceptible contacts to inform decisions on PEP and other follow-up activities**

Lessons Learned (cont.)

- Quarantine challenging in congregate living facilities
- Detailed quarantine protocol necessary for success
- Symptom watch approach helpful for those who have unknown immunity or received PEP
- Healthcare “tool kit” development important (i.e. guidelines, template letters, and spreadsheets)

Lessons Learned (cont.)

- **MDH refugee health staff access to CDC records helpful in documenting vaccine status**
- **Vaccination recommendations for those traveling internationally must be clearly communicated**

Conclusions

- **Measles cases due to importations will continue**
- **Potential for spread in communities where immunizations rates are low**
- **Vaccine hesitancy is important to address**
- **High immunization rates offer protection, but “pockets” of under or unvaccinated fuel small outbreaks that require resource intensive follow-up**

MDH Acknowledgements

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Cathy McCoy, Medical Assistant

Carol Thunstrom, PHN

Kate Conzemius, PHN

Shelter B Management

Chris Moore

Charlotte Kinzley

Numerous staff and volunteers to set up clinics,
meet with families, investigate cases

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- Dakota County Disease Prevention and Control Staff

VISITING ANOTHER COUNTRY? PROTECT YOUR FAMILY.

THINK MEASLES.

Measles is widespread in places like Europe, Africa, Asia, India, and the Philippines.



BEFORE YOU TRAVEL

Tell your doctor where you are traveling. Babies and children may need measles protection at a younger age than usual.

AFTER YOU TRAVEL

Call your doctor if anyone gets a fever and rash within 3 weeks of returning from your trip. Describe where you traveled.

✈️ Talk with your doctor if you are planning an international trip.

For more information go to www.cdc.gov/travel.