

Mumps Outbreak — Colorado, December, 2016–April, 2017

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BACKGROUND

- Mumps in the United States and Colorado
 - >6000 mumps cases reported in the U.S. in 2016, with a large outbreak among the Marshallese community in Arkansas
 - Average annual mumps cases in Colorado during 2008–2016 was 7 (range 4–17 cases)
- Colorado outbreak:
 - January 20, 2017: 4 mumps cases reported among attendees of a Marshallese church in the Denver metropolitan area
- Republic of the Marshall Islands (RMI)
 - Large diaspora in the United States
 - Unique immigration status due to U.S. nuclear testing in the 1950's in the Marshall Islands: no visa requirements, no required immunizations upon immigration, not eligible for Medicaid



METHODS

- Active case finding
 - Household-level interviews from church roster
 - Collaboration with state and 2 local public health agencies
- Passive surveillance
 - Laboratory reporting of positive mumps IgM serology or mumps RT-PCR by laboratories and clinicians
- Public health interventions
 - Vaccination clinics offered at local Marshallese churches
 - Clinician notification by Health Alert Network
 - Targeted messaging about mumps and the measles, mumps, rubella (MMR) vaccine in churches, social media, radio

Mumps Case Definition*

Probable	Confirmed
Acute parotitis ≥2 days AND (any of)	Positive mumps RT-PCR or culture AND (any of)
	<ul style="list-style-type: none"> Acute parotitis ≥2 days Aseptic meningitis / encephalitis Hearing loss Orchitis / oophoritis / mastitis / pancreatitis
<ul style="list-style-type: none"> Positive mumps IgM Epidemiologic link 	

* Council of State and Territorial Epidemiologists mumps case definition used in this investigation, with additional criterion of having an epidemiologic link to this outbreak or community.

RESULTS

Figure 1. Mumps Cases by Symptom Onset Date (n = 47)

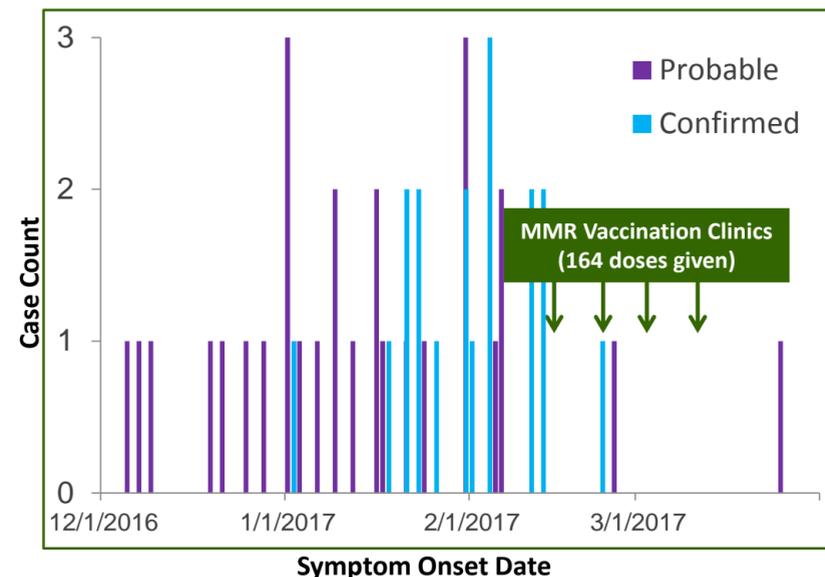
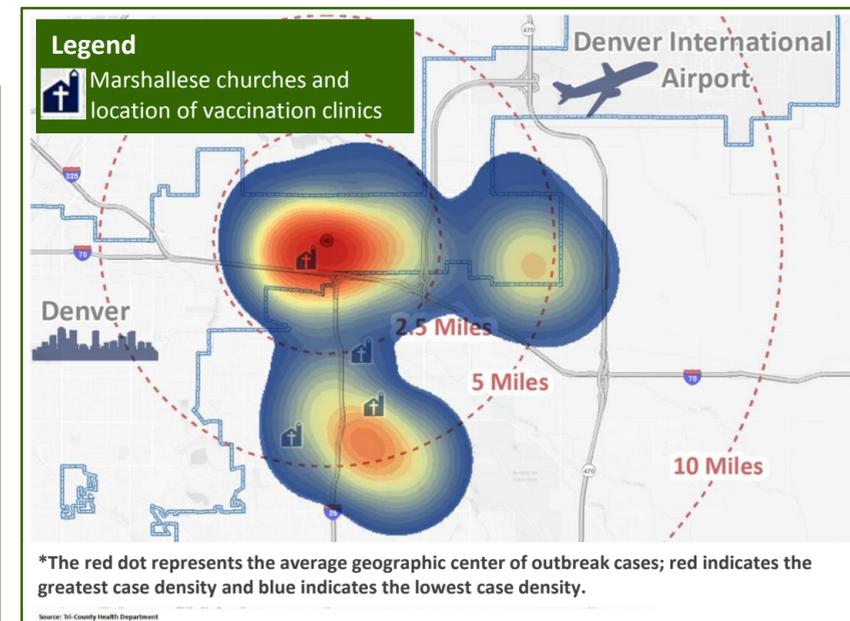


Figure 2. Heat Map* of Outbreak Cases, Dec. 2016–Feb. 2017



*The red dot represents the average geographic center of outbreak cases; red indicates the greatest case density and blue indicates the lowest case density.

Figure 3. Advertisement for MMR Vaccination Clinic

Table 1. Mumps Outbreak Case Characteristics

Case Characteristic	Outbreak Cases (n = 47)
Median age, years (range)	20 (0–44)
Male gender	24 (51%)
Marshallese	46 (98%)
Case Status	9 (82%)
Probable	30 (64%)
Confirmed	17 (36%)
MMR Vaccination Status	
None / Unknown	34 (72%)
1 MMR	3 (6%)
2+ MMR	10 (21%)
Household size, median (range)*	6 (5–12)

* Data from 13 households provided during active case finding interviews.

SUMMARY

- Outbreak cases were typically un- or under-vaccinated Marshallese young adults
- Tight geographic clustering of cases reflected sociocultural norms of close social networks and large household sizes
- Gaining early trust of community leaders enabled rapid implementation of tailored public health messaging and church-based vaccination clinics

The MMR vaccine



CONCLUSIONS

- Active case finding helped to define the outbreak magnitude and disseminate public health messaging
- “Force of infection” driven by high household density and close knit community structure might have contributed to transmission within the Marshallese population in Denver
- Cultural sensitivity and respect for community leadership enabled wide promotion of the MMR vaccination
- Rapid implementation of high impact church-based vaccination might have helped to contain the outbreak

CHALLENGES

- Cultural differences
 - Community-driven, not individual-driven priorities
 - Language difference
 - Historical injustices driven by discrimination and racism
- Communication style & access
 - Not preferred: email, phone
 - Preferred: social networks, church gatherings, Facebook, radio
- Limited access to health care
 - Most cases sought care at the emergency room, rather than at a primary care facility
 - Low rates of insurance

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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