

MEASLES HITS HOME

Sobering lessons from 2 travel-related outbreaks

Measles recently infected US residents not considered at risk, as well as the unvaccinated

2 TRAVEL-RELATED OUTBREAKS

CALIFORNIA - A February 22 early-release CDC report¹ linked 12 measles cases in California to an unvaccinated 7-year-old boy infected while traveling in Europe with his family in January. He was taken to his pediatrician after onset of rash, and to the emergency department the next day, because of high fever and generalized rash. No isolation precautions were used in the office or hospital.

The boy's 2 siblings, 5 children at his school, and 4 children at the doctor's office while he was there contracted measles (3 of whom were infants <12 months of age).

Nearly 10% of the children at the index case's school were unvaccinated because of personal belief exemptions.

PENNSYLVANIA, MICHIGAN, TEXAS - A young boy from Japan participated in an international sporting event and attended a related sales event in Pennsylvania last August. He was infectious when he left Japan and as he traveled in the United States.

The CDC² linked a total of 6 additional cases of measles in US-born residents to the index case: another young person from Japan who watched the sporting event; a 53-year-old airline passenger and a 25-year-old airline worker in Michigan; and a corporate sales representative who had met the index patient at the sales event and subsequently made sales visits to Houston-area colleges, where 2 college roommates became infected.

Viral genotyping supported a single chain of transmission, and genetic sequencing linked 6 of the 7 cases.

Measles is still a threat. Endemic transmission of measles no longer occurs in the United States (or any of the Americas), yet this highly infectious disease is still a threat from importation by visitors from other countries and from US residents who have traveled abroad. Two recent outbreaks (described at left) illustrate these risks.

What the CDC discovered

The 2 outbreaks of import-linked measles brought home—literally—the sobering facts about vulnerability among US residents. The CDC report^{1,2} of its investigation observed:

US travelers can be exposed almost anywhere, developed countries included. The California outbreak started with a visit to Switzerland.

Measles spreads rapidly in susceptible subgroups, unless effective control strategies are used. In California, on 2 consecutive days, 5 school children and 4 children in a doctor's office were infected; all were unvaccinated.

People not considered at risk can contract measles. Although 2 doses of vaccine are 99% effective, vaccinated individuals, such as the college students, can contract measles. Likewise, people born before 1957 may not be immune, in contrast to

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3 infants too young to be vaccinated contracted measles in their doctor's office in San Diego, in January 2008. (An infant with measles rash [above] is for illustration only, and does not depict any of the 3.)

IMMUNIZE, IMMUNIZE, IMMUNIZE

Inform concerned parents about the safety and effectiveness of vaccines.

2 doses of measles-containing vaccine are 99% effective.

Those exposed who are not immune should be vaccinated or offered immune globulin if the vaccine is contraindicated.

Contraindications

- Primary immune deficiency diseases of T-cell functions
- Acquired immune deficiency from leukemia, lymphoma, or generalized malignancy
- Therapy with corticosteroids: 2 mg/kg prednisone > 2 weeks
- Previous anaphylactic reaction to measles vaccine, gelatin, or neomycins
- Pregnancy

MEASLES BASICS

Fewer than 100 cases of measles occur in the United States each year, and virtually all are linked to imported cases.³ Before vaccine was introduced in 1963, 3 to 4 million cases per year occurred, and caused, on average, 450 deaths, 1000 chronic disabilities, and 28,000 hospitalizations.¹ Success in controlling measles is due largely to high levels of coverage with 2 doses of measles-containing vaccine and public health surveillance and disease control.

Measles virus is highly infectious and is spread by airborne droplets and direct contact with nose and throat secretions. The incubation is 7 to 18 days.

Measles begins with fever, cough, coryza, conjunctivitis, and whitish spots on the buccal mucosa (Koplik spots).⁴ Rash appears on the 3rd to 7th day and lasts 4 to 7 days. It begins on the face but soon becomes generalized. An infected person is contagious from 5 days before the rash until 4 days after the rash appears. The diagnosis of measles can be confirmed by serum measles IGM, which occurs within 3 days of rash, or a rise in measles IGG between acute and 2-week convalescent serum titers.

Complications: pneumonia (5%), otitis media (10%), and encephalitis 1/1000. Death rates: 1 to 2/1000, varying greatly based on age and nutrition; more severe in the very young and the malnourished. Worldwide, about 500,000 children die from measles each year.⁵

Immunity is defined as:

- 2 vaccine doses at least 1 month apart, both given after the 1st birthday,
- born before 1957,
- serological evidence, or
- history of physician-diagnosed measles.

the general definition of immunity (see Measles Basics, left). Case in point: the airline passenger, born in 1954.

Disease can be severe. The 40-year-old salesperson (no documented vaccination) was hospitalized with seizure, 105°F fever, and pneumonia. One of the infants was hospitalized due to dehydration.

People in routine contact with travelers entering the United States can be exposed to measles—like the airline worker.

Take-home lessons for family physicians

Include measles in the differential diagnosis of patients who have fever and rash, especially if they have traveled to another country within the past 3 to 4 weeks. Any patient who meets the definition of measles (fever 101°F or higher; rash; and at least 1 of the 3 Cs—cough, coryza, conjunctivitis) should be immediately reported to the local health department. The health department will provide instructions for collecting laboratory samples for confirmation; instructions on patient isolation; and assistance with notification and disease control measures for exposed individuals.

Immunize patients and staff. These recurring cases of imported measles underscore the importance of maintaining a high level of immunity. Outbreaks can happen even where immunity is 90% to 95%. When vaccination rates dip below 90%, sustained outbreaks can occur.⁶

Ensure that staff and patients are all immunized against vaccine-preventable diseases, and inform concerned parents about the safety and effectiveness of vaccines. Parents who refuse to have their children vaccinated place their children at risk and contribute to higher community risk. Communities that have higher rates of non-adherence to vaccine recommendations are more likely to have outbreaks.^{7,8}

Use strict infection control in the office. The recent outbreak in California where 4 children were infected in their physician's office reinforces the need for strict

infection-control practices. Do not allow patients with rash and fever to remain in a common waiting area. Move them to an examination room, preferably an airborne infection isolation room. Keep the door to the examination room closed, and be sure that all health care personnel who come in contact with such patients are immune. Do not use triage rooms for 2 hours after the patient suspected of having measles leaves. Do not send these patients to other health care facilities, such as laboratories, unless infection control measures can be adhered to at those locations. Guidelines on infection control practices in health care settings are available.^{9,10}

Quick response

Quick control of these outbreaks shows the value of the public health infrastructure. Disease surveillance and outbreak response is vital to the public health system, and its value is frequently under-appreciated by physicians and the public. ■

References

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