

Immunization-Preventable Outbreaks, 2014

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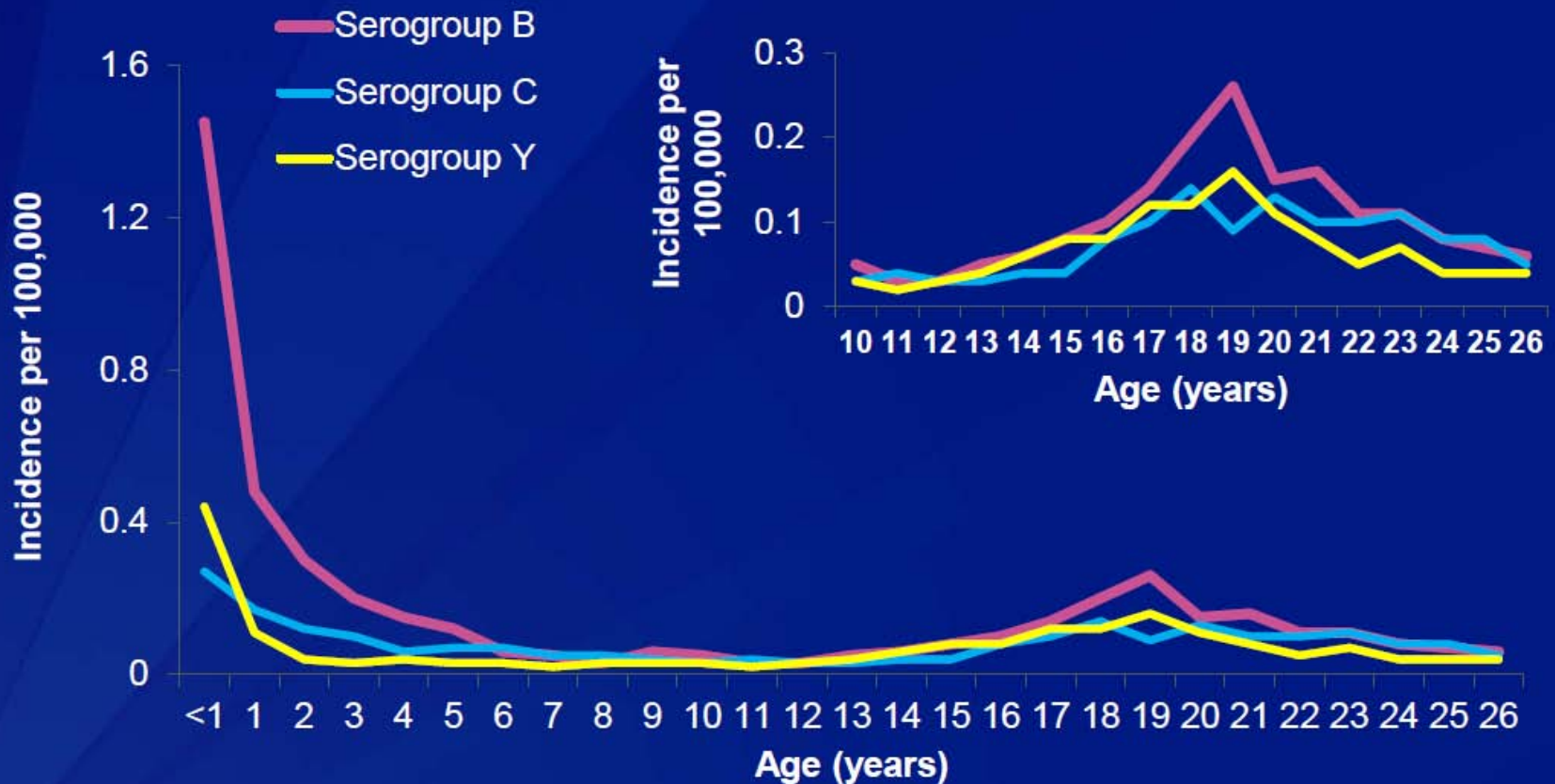
Outbreaks to Cover

- Meningococcus group B
- Pertussis
- Mumps
- Measles

Serogroup B Meningococcal Disease at Princeton University

- 8 cases from March-November, 2013
 - Attack rate 134/100,000 in undergraduates
 - No deaths, 2 with neurocognitive sequelae
 - All undergraduate grade levels affected
- All cases caused by an identical MenB strain
- MenB NOT covered by ACIP-recommended meningococcal vaccine
- MenB+OMV vaccination recommended for Princeton undergraduate students

Incidence of Meningococcal Disease by Age and Serogroup, United States, 2005-2012*



*Source: National Notifiable Diseases Surveillance System (NNDSS) with additional serogroup data provided by state and local health departments

Bexsero

- Recombinant MenB+OMV Vaccine
- Contains 4 outer membrane vesicle antigens:
 - fHBP, NHBA, *NadA*, PorA
- Licensed in Europe, Australia, and Canada
- Immunogenicity used to infer immunity
- Safe in adolescents and adults with 1584 tested
- 2 of 4 antigens found in Bexsero expressed by Princeton strain

Serogroup B Meningococcal Disease in UC-Santa Barbara

- 4 cases in undergraduates in November, 2013
- 1 case found in March, 2013
- Attack rate of 21.1/100,000
- Identical strain in all 4 cases
 - Multiple antigens in common with Bexsero

UCSB Campaign

- CDC-sponsored expanded access IND approved by FDA
- Targets of campaign
 - All undergraduates
 - Graduate students or faculty living in dormitories
 - Those with high risk conditions (asplenia, complement deficiency, etc)
- Two doses given: February-March first dose campaign, second dose in April
- Approximately 20,000 persons
- >50% got first dose, about 1/3 got two doses
- No new cases since November

Pertussis in California

- Outbreaks recently reported in:
 - Northern California pockets in 2013
 - San Diego
 - 298 cases in 2014
 - 53 cases at this time last year
 - Long Beach with significant increase in cases this year
 - Orange County with 28 cases so far this year- increased, but not significantly from past years

Mumps Outbreaks Nationally

- Central Ohio
 - 299 cases from January 7-April 29, 2014
 - Three-quarters of all the reported cases nationwide
 - 179 linked to Ohio State University
- Fordham University with 13 suspected cases on two campuses

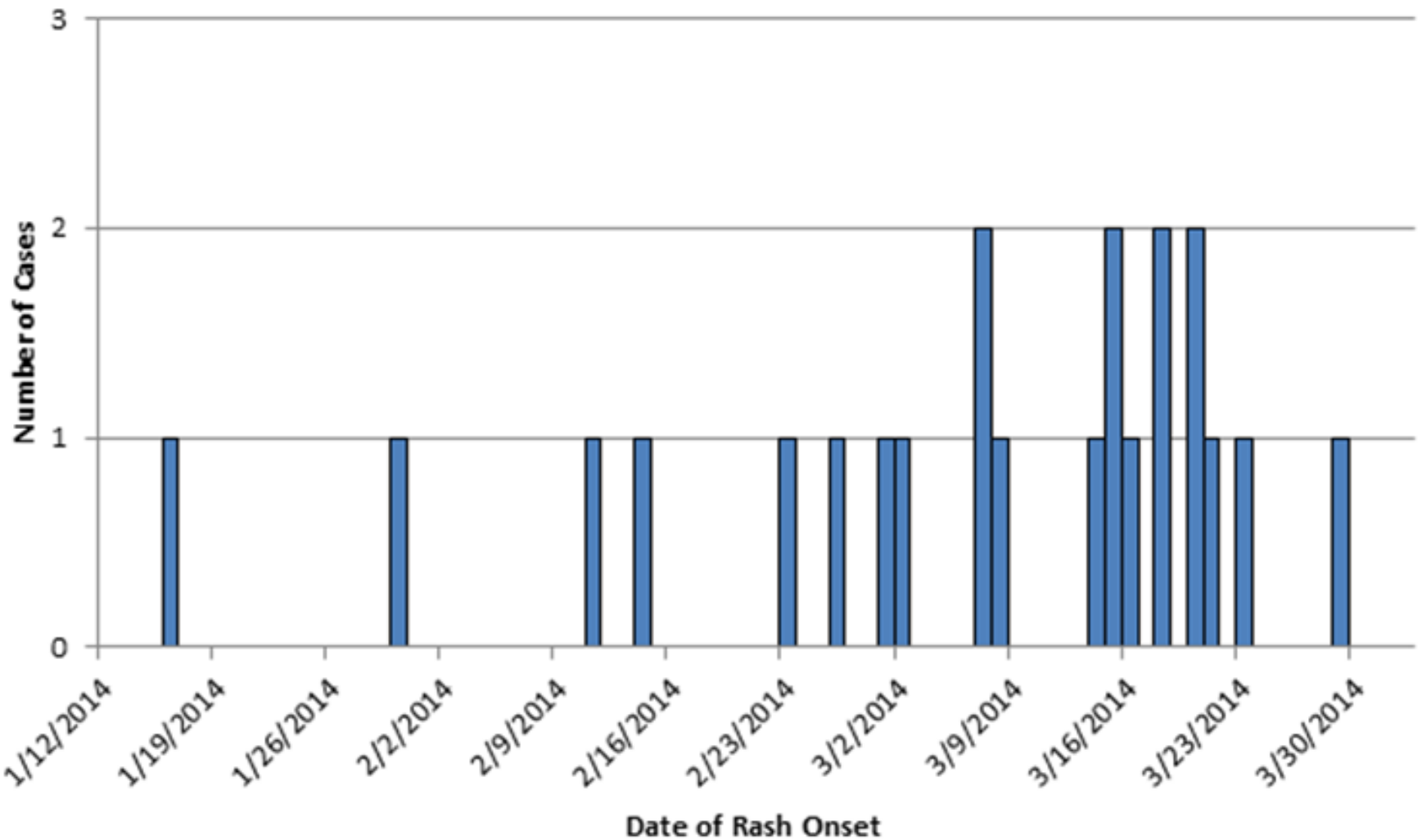
Measles in Orange County

- 22 cases in Orange County since January 1
- Age range 3-45
- 11 males
- 11 females
- 7 hospitalized
- All recovered

Measles Cases by Exposure

- 1 with history of travel to Asia
- 1 with exposure to travelers
- 15 with history of exposure to another case
 - 5 health care workers
- 5 with no history of travel or contact with travelers
- Cases distributed throughout county
- Multiple clusters occurred

Orange County Measles Cases' Rash Onset Dates January - March 2014



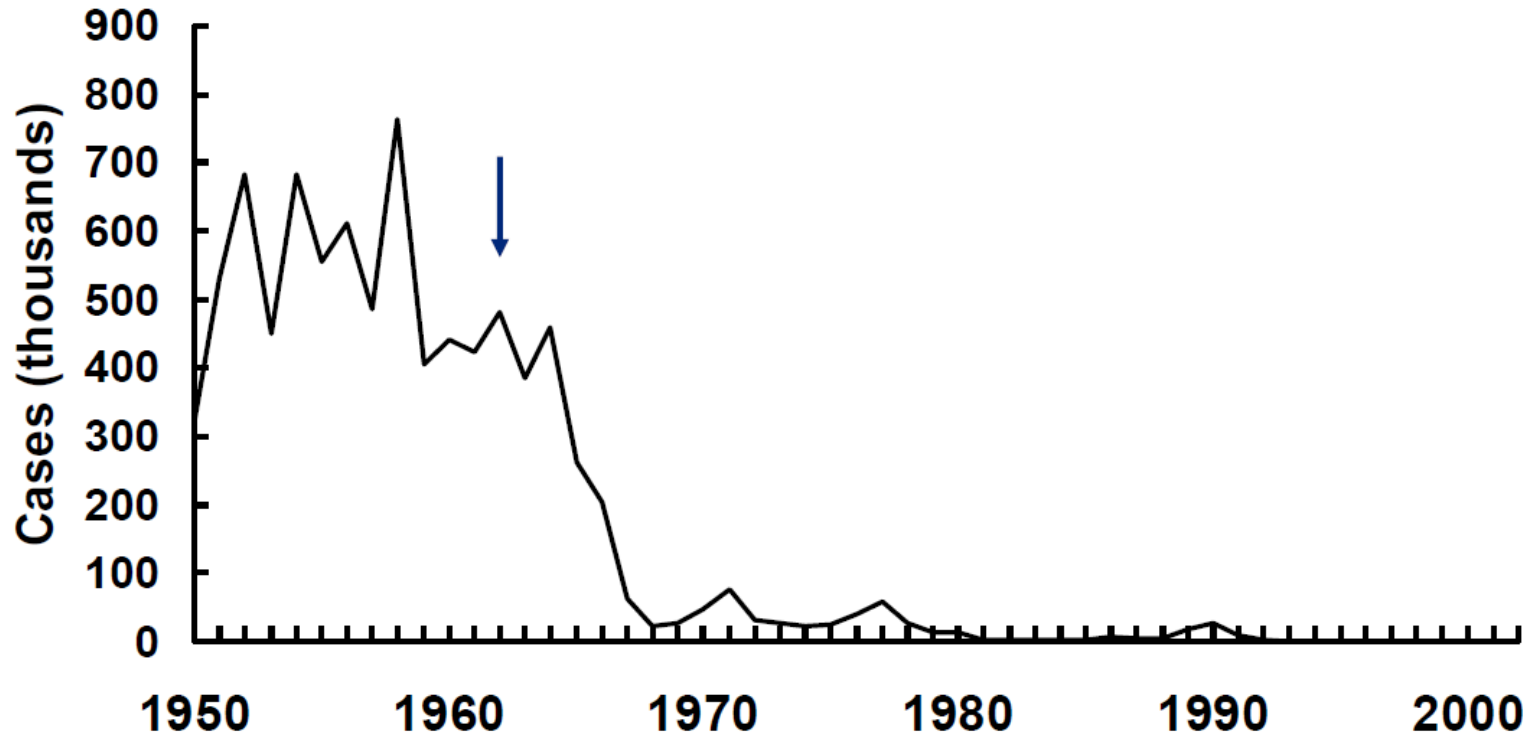
Measles Cases and Immunization History

- 5 unimmunized- all children
 - 2 children of vaccine-refuser parents
- 6 with history of at least two MMRs
 - 97-99% effective
- 4 with history of positive serum antibody titer
 - >99% reliable in predicting immunity
- 7 with uncertain vaccination histories
- 4 of 5 healthcare workers with history of immunization or serologic immunity

Measles in California

- 58 cases since January 1
- Age range 5 months-60 years
- 12 hospitalizations
- 13 importations
 - Eight from Philippines
 - Other cases from India, Singapore, Vietnam and Western Europe
- 12 measles clusters
- 25 of 58 were unvaccinated
 - 19 of 25 had philosophical objections
- 15 with documented vaccination or serologic evidence of immunity prior to developing disease
- 18 with no vaccine history

Measles in the United States



By RYAN JASLOW / CBS NEWS / March 7, 2014, 2:34 PM /

Measles outbreak in New York City, health officials warn



NYC HEALTH DEPARTMENT

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America's biggest city has a measles outbreak on its hands.

New York City health officials warned unvaccinated New Yorkers that they should

Measles in the United States

- Nationally, an increase has been noted in the number of imported measles cases with travel to the Philippines
- Measles is endemic in the Philippines
 - Cases have been on the rise there since mid-2013
 - Significant increase after Typhoon Haiyan in November 2013



Measles Symptoms

- Incubation period 8-12 days
 - Range of 7-21 days
- Symptoms first 2-4 days:
 - Fever
 - Cough
 - Coryza
 - Conjunctivitis
 - Koplik's Spots
- Rash follows
- Sequelae include pneumonia and encephalitis
- Mortality rate is 1 in 1000 cases



Measles Infection Control

- Measles is extraordinarily infectious
- Airborne precautions
- From time patient in room until 1 hour after leaving
- No minimal time of exposure
- Thousands exposed in OC this way!

Measles

Exclusion from work
until 4 days after rash onset

CONTACT
FOLLOW-UP

Possible exposure period

Communicable period

- 21 -17 -14 -11 -7 -4 0 +4

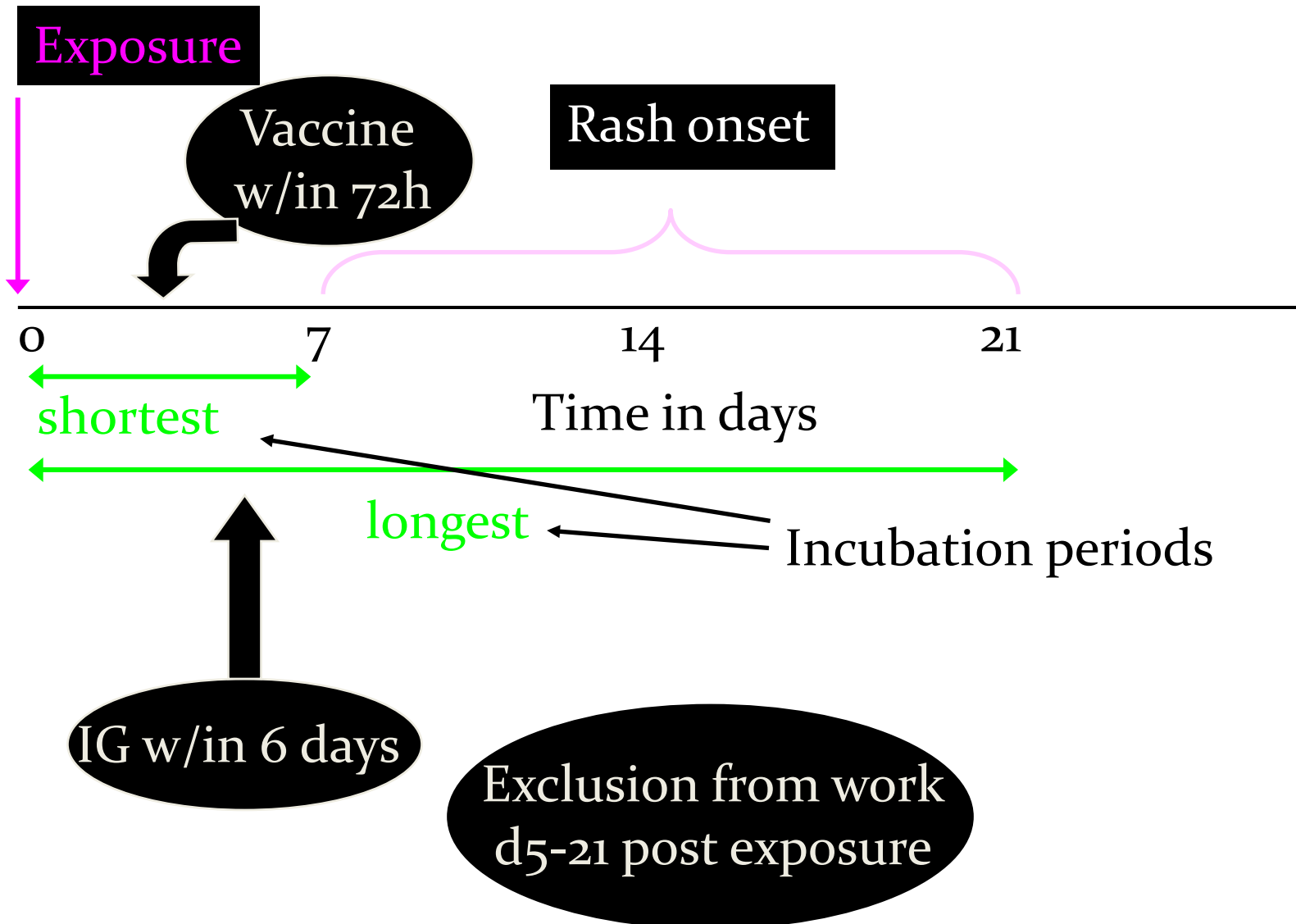
Time in days

← longest
Incubation periods
shortest →

Rash onset
(day zero)

Prodromal period

Measles Follow Up of Exposed



MMR Vaccine

- Recommended in two doses:
 - 12-15 months of age
 - 4-6 years of age
- 95% are immune after first dose
- 97-99% immune after second dose
- No need for “booster”
- Second dose can be given anytime 28 days after the first dose
- Vaccine can be given from 6-11 mos of age if travel or outbreak setting, though dose will need to be repeated

MMR Vaccine

- Protective if given within 3 days of exposure
- Provides lifelong protection
- Inexpensive
- No downside to extra dose of MMR
- Can't give to under 6 months of age
- Can't give to pregnant or immune compromised

Immune Globulin

- Effective if given within 6 days of exposure
- Provides limited protection
- Immunization with live vaccines needs to be delayed 5 months
- Dosage is 0.5mL/kg for measles exposures
- Expensive
- Limited supply
- Targeted to high risk persons: close exposure, infants, immune compromised

Possible Measles Cases in the Clinical Setting

- Move them to airborne isolation as quickly as possible
- Clinics may consider having patient seen outside, or after all other patients gone
- Assure that patient is cared for by staff who have received two MMR's

Case Study

- 18 year old Mexican American male
- Exposed while in waiting room with previous case
- Developed fever 9 days after exposure
- Went to medical provider, told likely viral
- Came back when rash developed
- Serum measles IgM and throat and urine PCRs positive
- Had two documented MMRs

Measles Exposures: High Risk vs. Non-High Risk

High-risk Criteria:

- Close contact to a case
 - Family member
 - Workplace exposures
 - Close exposure over significant period of time
- Immunocompromised
- Pregnant woman
- Persons who in or attend high risk settings:
 - Healthcare
 - Day cares
- If not fitting criteria above, considered non-high risk
 - Medical facility exposures generally non-high risk

Presumption of Immunity

- High Risk:
 - Two MMRs
 - Measles serum IgG positive
- Non-High Risk:
 - Surveyed for evidence of immunity

Indications of Immunity for Non-High Risk

- Born before 1957-95% immune
- Attended California schools after 1970
- Military service
- Green card after 1996
- Recall being vaccinated with MMR

Case Study Exposures

- Family
- Urgent Care
- Local ED
- Work site
- School

Case Study Household Exposures

- Family:
 - Parents
 - Sister
 - Brother-in-law
 - 3 month old nephew
- All serologically immune aside from nephew
- Nephew given IG
- None developed symptoms

Case Study Healthcare Exposures

- 10 patients and families at urgent care
- 3 patients and families at ED
- All contacted and surveyed for high-risk criteria and likely immunity status
- No secondary cases developed
- Overall:
 - We found very few secondary infections in healthcare exposures
 - 95% of those that we tested serologically were immune
 - We shifted contacting these persons to hospitals or providers

Case Study Workplace Exposure

- Worked at a fast food facility two times during infectious period
- 17 coworkers were exposed there
 - Required proof of immunization with two MMRs
OR
 - Serologic measles IgM positive
 - Quarantined until proof of immunity
- All staff tested serologically positive

Case Study Attended Western High School

- 2700 children at this school
- Attended school for one day while infectious
- 4 of 2700 students did not have two documented MMRs by school
 - On further examination, only one of these four did not have some evidence of MMR
- No further cases documented at school

School Recommendations

- Assure adequate immunization for:
 - Children
 - Staff

Welcome to CAIR
**California Immunization Registry
Bay Area Region**

Login As:

Provider ID:

User ID:

Password:

NEW [Latest Release Notes](#)

Privacy Reminder and Other Disclaimers:
By clicking the login button below, you consent to:
-- comply with California law ([Health and Safety Code 120440](#))
-- protect the confidentiality of information contained in this database
-- look up information only on your patients or clients

[Forgot Password?](#)

**** IMPORTANT NOTICE ****

Our Community Messages

- If you think you have measles, do NOT just go to your doctor's office, call for advice
- Providers need to use appropriate protection even if immunized or serologically immune
- Vaccinate your children!