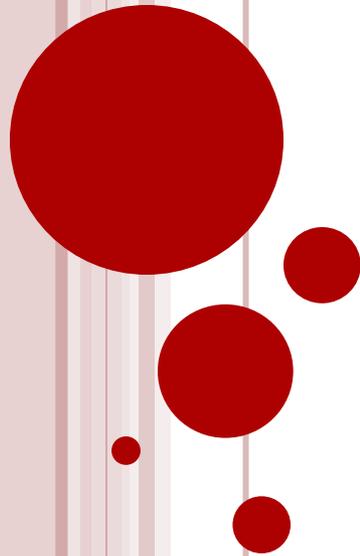


THE INFECTION PREVENTION & CONTROL RESPONSE AND PERSPECTIVE TO A LARGE- SCALE MEASLES EXPOSURE

**Saskia van Rijn, MPH, MA, CIC
Phoenix Children's Hospital**



OBLIGATORY “ABOUT MEASLES” SLIDE

Measles is probably the best argument for why there needs to be global health, and why we have to think about it as a global public good. Because in a sense, measles is the canary in the coal mine for immunization. It is, you know, highly transmissible. The vaccine costs 15 cents, so it's not - you know, shouldn't be an issue in terms of cost.

– Dr. Seth Berkley

Measles (Rubeola) is a highly contagious viral disease and is passed through direct contact and through droplets in the air. It lives in the nose and throat mucus of the infected person and can spread through coughing and sneezing.

- $R_0 = 12-18$ and herd immunity is roughly 94%
- Requires Airborne isolation – virus remains active and contagious in the air or on infected surfaces for up to 2 hours.
- Infected persons can transmit the disease from 4 days prior to the onset of the rash, until 4 days after the rash erupts
- Incubation period is 7-14 days (average is 10 days and in some rare cases, it can be as long as 21 days).
- One dose of MMR vaccine is 93% effective against exposure and two doses are 97% effective.
- Outbreak associated with Disneyland exposure (147 people sickened) between 12/15-12/20, 2014.



Measles

IT ISN'T JUST A LITTLE RASH



Measles can be dangerous, especially for babies and young children.

MEASLES SYMPTOMS TYPICALLY INCLUDE

- High fever (may spike to more than 104° F)
- Cough
- Runny nose
- Red, watery eyes
- Rash breaks out 3-5 days after symptoms begin



Measles Can Be Serious



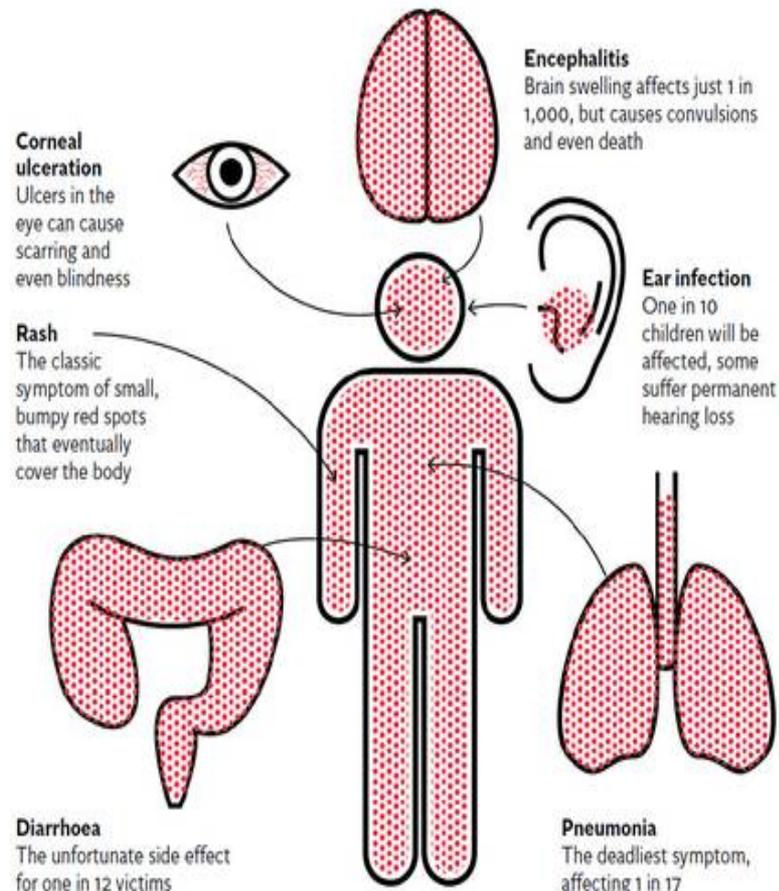
About 1 out of 4 people who get measles will be hospitalized.



1 out of every 1,000 people with measles will develop brain swelling due to infection (encephalitis), which may lead to brain damage.

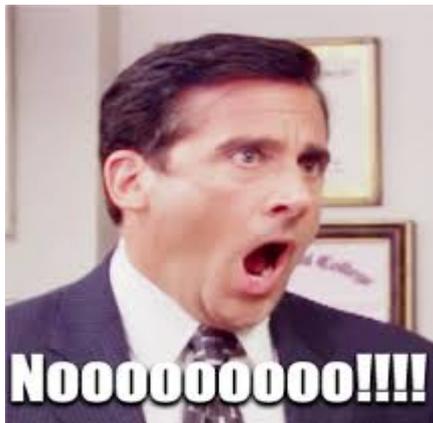


1 or 2 out of 1,000 people with measles will die, even with the best care.

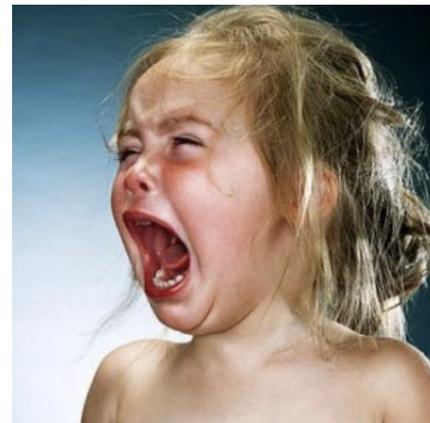


HOW IT ALL BEGAN....

- Thursday, January 22nd, 2015 –IP&C was notified (via MCDPH and Pinal County Health Department) that a family member of a patient who had been seen at our East Valley Urgent Care (EVUC) on 1/11 was now positive for measles.



IP&C's
response



TIMELINE

1/11 -
Patient
0 visits
EVUC

1/22 -
MCDPH
notifies
PCH
IP&C
that a
family
member
of
Patient
0 has
tested
positive
for
measles.

1/24 -
MCDPH
contacts
IP&C that
female
adult has
developed
rash and
meets
clinical
definition.
Response
measures
are
initiated.

1/26 -
Pharmacy
provides
IG to
susceptible
patients.
ADHS,
MCDPH, &
PCH
coordinate
notific.

1/28-
SAFER
and EIS
aid in
contacti
ng 195
families.
MCDPH
algorith
ms
initiated

1/20-
1/21
Adult
female
present
@ EVUC

1/23 -
PCH
IP&C
sends
out
notifica
-tions.
Adult
female
present
during
this
time is
identifi
ed as
sick on
1/21

1/25-
Hospital
administ
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team
meet to
establish
plan for
IG
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Families
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notified.

1/27
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1/29-
EMR
notific
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trigger
goes
live.



LET'S START FROM THE BEGINNING

- **Afternoon on 1/22 (Thursday)** – IP&C was notified that a family member of a patient who had visited the EVUC on 1/11 tested positive for measles.
 - The patient was seen on 1/11 (CC: ear pain - no rash, but a fever and non-specific symptoms). Several ill family members at home were noted. Immunization status documented as UTD. Patient's father and physician reviewed travel history.
 - MCDPH/IP&C decided to move forward, presuming that the patient was also positive for measles. In response to this, IP&C:
 - Identified a timeline of exposure
 - Coordinated with the manager of EVUC to pull a patient and staff list for those in the building just prior to the patient entering +2 hours after they left.
 - 18 patient families were exposed
 - All exposed staff were identified and titers were reviewed by Occupational Health.
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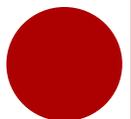
LET'S START FROM THE BEGINNING

- **1/23 (Friday)** – IP&C called all families involved to notify of exposure (18 pts total). Exposure letters were developed and mailed to families. PCP letters were made and faxed to the PCP's of exposed patients.
 - Later Friday morning, it was established that an adult female with negative titers (but had been fully vaccinated) was sick on 1/21/2014 (and present at the EVUC on 1/20). She was also present at the EVUC on 1/11.
 - MCDPH contacted the adult female to establish a time frame and followed up due to concern for potential measles as her exposure/illness matched the appropriate incubation timeline.

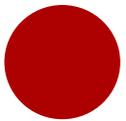


AND NOW IT ALL GOES DOWN THE DRAIN

- **1/24 (Saturday)-** IP&C receives word from MCDPH that the adult female developed a rash and meets definition for measles.
 - IP&C coordinated with manager of EVUC and IT VP to pull patient logs for timeframe (time adult female was present at EVUC + 2 hours after she left to account for air circulation and filtration).
 - IP&C team (3 IP's and our medical director) + our CNO initiated chart review at 11:30pm-3:30am to identify children that needed IG immediately due to lack of immunity (immunosuppression or being
 - 25 patients were identified from list of 190+ that met definition for IG.
 - IG had to be administered to 25 eligible patients on 1/26 or 1/27, depending on their day of exposure.
 - Communication from IP&C Medical Director and CNO to our Pharmacy regarding availability of IG
 - Plans to regroup on Sunday 1/25



LET'S START FROM THE BEGINNING

- **1/25 (Sunday) – IP&C regroups at 11am to plan response and communications measures.**
 - **Administration-level conference call to discuss plan for IG acquisition (PCH did not have the necessary amount for all 25 eligible patients), dispersion, billing, notification plans, and general response and overview of exposure.**
 - **Quality Management Director aids IP&C in contacting list of patients that are eligible for IG.**
 - **Plan: IG would be given to eligible families at the EVUC.**
 - **All families were contacted by the evening of 1/25 – secondary attempts were also made in case IP&C did not directly reach the family/guardian of the patient.**
 - **Letters to families (both IG-eligible and general notifications) and PCP's were developed.**
 - **IP&C (via IP's and our Medical Director) maintained communication with MCDPH to update our status and plan.**
 - **Database of exposed patients, immune status, contact information, and contact efforts was developed.**
- 

A NEW WEEK – NEW CHALLENGES

- **1/26 (Monday) – Notifications and IG distribution**
 - Pharmacy coordination was successful in acquiring enough IG supply for 25 eligible patients.
 - IP&C attempted a 3rd follow-up with patients that were contacted on 1/25.
 - PCH IT coordinated to pull patient/PCP contact information for all exposed patients.
 - Letters to families and PCP's were finalized and sent to PCH Translation services and then sent to MCDPH.
 - MCDPH incorporated additional information to notification letters and they are sent back to PCH Translation.
 - Notification letters (4 total: 2 to families needing IG with different dates depending upon exposure, and 2 to families that were not eligible for IG with the different dates of exposure).
 - Quality Management Dpt aided in the faxing of PCP letters and certified mailing of family letters (IG eligible took first priority).
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MONDAY – THE LONGEST DAY OF THE WEEK

- **1/26 (Monday) – Notifications and IG distribution**
 - **IP&C worked with MCDPH to finalize script for patient notification calls.**
 - **IP hunkered downs at EVUC to ensure the IG process and documentation go smoothly**
 - **MCDPH/ADHS determined that additional questions are needed from patient notification calls (information about contacts, MMR history, etc.) for epidemiological purposes.**
 - **Per MCDPH/ADHS recommendations, immunocompromised patients and those without documented MMR's (1st shot minimum) were told that they needed isolation from school/work for the duration of the incubation period (part of the additional information in the letters).**
 - **With the addition of the supplemental questions, IP&C requested support for patient notification phone calls. CDC EIS officers (thanks Jefferson Jones and Candice Williams!) are able to assist in patient notification on-site at PCH.**



Epidemic Intelligence Service (EIS)
Boots-on-the-ground disease detectives



Maricopa County
Department of Public Health



Arizona Department of Health Services
Health and Wellness for all Arizonans



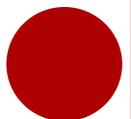
MONDAY – THE LONGEST DAY OF THE WEEK...SERIOUSLY.

- **1/26 (Monday) – Notifications and IG distribution**
 - **University of Arizona SAFER team (Thanks Kristen Pogreba-Brown!) also provided assistance in patient notification and coordination efforts.**
 - **The database for patient notification efforts was expanded and utilized for initiation of mass calls.**
 - **IP&C created and sent out SBAR to PCH staff with updated information on measles outbreak and PCH-related exposure.**
 - **Communications Department coordinated with IP&C and MCDPH on public responses.**

IF MONDAY MORNING



WERE A PERSON



A NEW DAY AND A TEAM OF PUBLIC HEALTH AWESOMENESS

- **Tuesday, 1/27 – Contact, contact, contact.**
 - **EIS and SAFER teams continued to contact families using the SAFER mass notification methodology (3 phone call attempts).**
 - **Last day for patients involved in 1/21 exposure to receive IG – IP&C attempted to contact any that haven't been reached.**
 - **Ongoing internal communication at PCH through Daily Safety Briefs and Communications department.**
 - **IP&C continued to receive phone calls from families in the community and even staff inquiring if they had been exposed.**
 - **Communications Department facilitated a joint-press statement.**



A MEDIA STORM MAKES LIFE SO MUCH MORE INTERESTING

- **Wednesday, 1/28 – IG window is closed but there was increasing public and media attention.**
 - **SAFER/EIS teams continued to call patients/families .**
 - **Influx of worried families called as the exposure reaches national media circuits.**
 - **IT assisted with setting up a hotline for IP&C**
 - **MCDPH algorithms for measles identification and notification were distributed to the PCH emergency department and urgent cares.**
 - **PCH Microbiology Department helped to establish a bundled lab order set for rule-out-measles cases (which also includes a trigger for Airborne isolation orders and notification via the IP&C on-call pager).**
 - **3 additional patients identified that weren't listed in the primary line-list.**
 - **IP&C calls the 3 families to discuss the exposure and immediately sends out letters.**



THINGS START TO WIND DOWN....SORT OF.

- **Thursday, 1/29** – Internal identification, EMR triggers, and lots of phone calls...
 - IP&C continued to work with IT to ensure the proper labs are drawn.
 - EMR trigger went live!
 - Influx of possible cases (none were confirmed cases) – puts strain on ED staff and availability of negative pressure rooms for Airborne isolation rooms.
 - Ongoing calls from community for concern that they were exposed to measles.

Exhaustion sets in.....



THINGS START TO WIND DOWN....SORT OF.

○ Friday, 1/30 - TGIF

- IP&C continued to respond to dozens of calls to the office and on the hotline voicemail.
- Notification calls were completed – all families received at least 3 attempts, 1 letter via certified mail, and 1 letter faxed to their PCP.
- Several rule-out cases were admitted to PCH and continued to put a strain on negative pressure room availability and staff (keep in mind – we were in the middle of respiratory virus season).
- Ongoing education with staff in ED and urgent cares about rapid isolation, use of PPE, and tenting techniques.
- Urgent Cares continued to use signage and masks - asking people to utilize them if they have a fever.

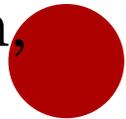


ONGOING PREPAREDNESS

- Continued education with ED staff on measles and other outbreaks.
- Ongoing screening for international travel and fever/illness.
- Workgroup around ED/UC exposures and necessity of rapid isolation and PPE use.
- Monitoring of exposed patients when visiting PCH during incubation period.



WORDS OF WISDOM AND OTHER LESSONS LEARNED

- It doesn't matter how many exposure you've dealt with, measles is a whole different ball game.
 - Communication is vital – identify your key stakeholders immediately and ensure everyone is on the same page.
 - Having existing exposure notification letters will help you – even if you don't think you need them.
 - Keep staff informed - even if they're not one of your stakeholders.
 - Ask families about when each person's illness started to construct a timeline that will help rule out the possibility of second generation cases.
 - Set up a hotline early in the process if it's a big exposure.
 - The mass population gets scared quickly and doesn't understand how infectious disease exposures work. Um, Ebola anyone?!
 - Keep your sense of humor.
- 

ALL-STAR LIST OF RIDICULOUS THINGS PEOPLE ASKED ABOUT MEASLES

- “My child came into the main PCH hospital in December for surgery – does she have measles now?”
- “We have an appointment scheduled at another PCH clinic, should we cancel it?”
- “We don’t believe in vaccinating our child but he was at the clinic on the 18th and no one called us. Why haven’t you called us? We deserve to know if he was exposed!”
- “We weren’t there on those days but no one called us. Shouldn’t you have called us if we visited that clinic?”



Elnathan John
@elnathan



Our thoughts are also with the measles-ravaged country America. I hope we are screening them before they come to Africa.



YOUR PARTNERS WILL SAVE YOU

- It takes a village – PCH: IT, Pharmacy, Translation Services, QM Department, CNO, Emergency Preparedness, Communications, Microbiology, etc.
- MCDPH – Especially Karen Rose, Alice Kerrigan, and Ron Kline.
- ADHS – Especially Jefferson Jones, Candice Williams, and Dr. Sunenshine
- University of Arizona MEZCOPH SAFER team

Most importantly – my fellow PCH IP's and our medical director – you're the bee's knees.

Sources:

CDC.(2015). Measles (Rubeola). <http://www.cdc.gov/measles/>.

Red Book, Chapter- Measles. (2015). American Academy of Pediatric Committee on Infectious Diseases. American Academy of Pediatrics.



QUESTIONS?

