

# Curbside Consultations

(aka “Hey, Doc - Got a Second?”)

ACOI’s 13th Annual Hospital Medicine Update  
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Baltimore

G. Blackburn DO, MACOI

Disclosures: none  
Comments: my own (unfiltered)

The wife of one of your distant relatives just texted and said she is taking her husband to the ER. He looks terrible, has a high fever, cough and an extensive rash.

These days, it's likely she may also have sent you a picture of the rash she took on her iphone. It started on his face and now has spread to his trunk.

She thinks he has pneumonia.



# Measles

- Cough
- Coryza (runny nose)
- Conjunctivitis
- plus high fever plus macular-papular rash beginning on the face

# Murphy's Law....

## (and our first suspected case)

- a middle aged gentleman, brought in by EMS, presented to our ER at 3:15 a.m. w/ a hx of N/V/diarrhea.
- No respiratory complaints. No fever.
- A blotchy facial rash was noted

# The good news:

- A very astute ER resident thought about measles, leading to the pt being placed in appropriate airborne isolation in a negative pressure room within a hour. (Great job, ER!!)
- Being 3 a.m., ER wait times were short and the number of other pts in the ER were limited
- The ID physician on call (who had been immunized as a child) saw the patient early that same morning. His exam included what he thought were Koplik spots, increasing his concern for measles. Nasopharyngeal and pharyngeal specimens for PCR for measles were obtained

# Koplik Spots





## The confusing information:

- After some delay, immunization history was of 2 doses of vaccine in Israel, but one of these was given before the age of 1 yr
- No recent travel
- Serology for measles, obtained on an urgent basis (it's Saturday, of course!) was positive for a very high IgG. IgM was unavailable

## The not so good news:

- A very atypical presentation
- Even though a specimen for testing was obtained early Saturday morning, the State Health Department, while considering measles a very urgent concern, was closed on the weekend!!
- The specimen was not able to be sent for PCR until the following Monday

- Results were not available until late Tuesday afternoon - too late for exposed, at-risk individuals to be immunized
- Only 2 days left to identify and notify at-risk individuals and to obtain and offer immunoglobulin
- PCR results?

# Disposition

- The patient was confined to the negative pressure room in the ER, never admitted, hydrated, and discharged home out the side door of the Emergency Room
- He was to confine himself to home, at least until the results of the PCR became available

## Traditional questions that now seem of limited value:

- Have they been out of the country?
- Are their immunizations up to date?
  - Many aren't sure

# Measles

- incubation period: ~ 14 days
- contagious period: ~ 4 days prior to and 4 days after development of rash
- $R_0$ : 12 - 18 - the most contagious of all infectious diseases!! Contagious airborne virus said to persist for up to 2 hours after patient has left the area

# Measles -

- ~1980: est. 2.6 million deaths/yr (worldwide)
- In the U.S., prior to 1963
  - 2 - 4 million cases of measles/yr
  - 48,000 hospitalizations/yr
  - 4000 cases of encephalitis/yr, 1/4 of which suffered life-long disabilities
  - 100 - 400 cases of SSPE/yr
  - 400 - 500 deaths/yr (current references cite 1 - 2 in 1000)

There's a reason most of you have never seen a case of measles (at least within the continental U.S.)



# Important Timelines

- **1957** - Born before this year? Likely exposed to measles
- 1963 - Introduction of measles vaccines - limited effectiveness, some with significant side effects
- 1971 - Introduction of current measles vaccine as a component of MMR
- **1989** - Second dose recommended

- Diagnosis: PCR of nasopharyngeal/pharyngeal specimens
- Treatment: supportive only (+ Vitamin A if malnourished)

- Prevention:
  - immunization - highly effective with 2 doses, but not 100%
  - “herd” immunity (if at  $> 93 - 95\%$ )
- Post-exposure prevention:
  - immunization w/in 3 days
  - immune globulin w/in 6 days  
(note: I.M. doses may be marginally effective)

# Measles

- Worldwide, still kills over 90 - 120,000 (mostly) children/yr; 400 deaths/day in 2013
- mortality may be as high as 1 in 10 in countries where severe malnutrition is rampant
- infrequently seen in the U.S. and other advanced countries until recently
- nearly 100% preventable

By CARTER EVANS / CBS NEWS / January 11, 2015, 9:02 PM /

# Measles outbreak at Disneyland linked to non-vaccinations

51 Comments / f 2.1K Shares / t 733 Tweets / Stumble / @ Email More +

Health officials fear thousands may have been exposed to the measles at Disneyland and Disney California Adventure last month. Most of those who got the disease were not vaccinated against it.

With tens of thousands of visitors from around the world -- in close contact -- every day, the "Happiest Place on Earth" was an ideal place for the highly contagious disease to spread, according to epidemiologist, Dr. Mark Zahn.

"You can be reasonably near someone, or breathe it in over time and you can become infected," said Zahn.



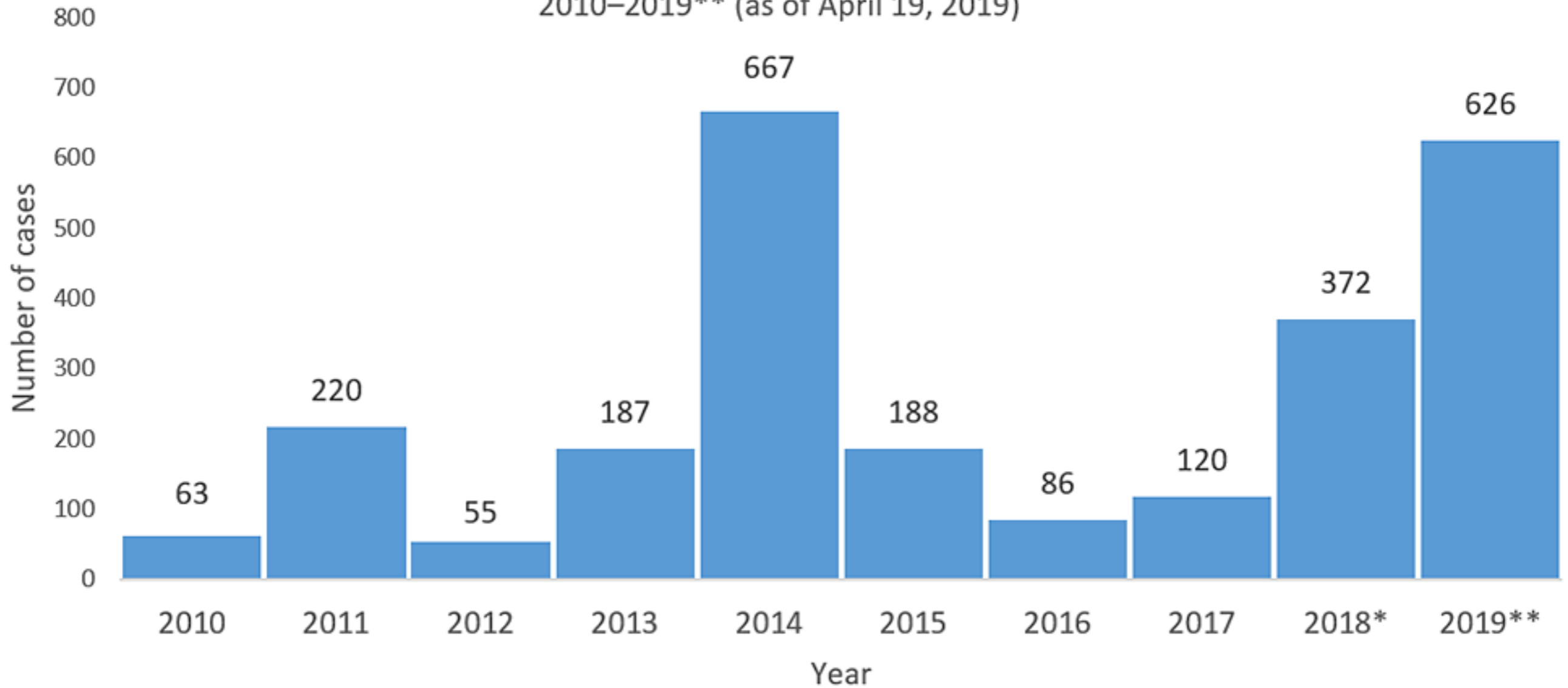
2014: 667 cases in U.S.

# Ultimately....

- At least 147 cases related to Disneyland outbreak
- Of those with reliable immunization history, 6% had been appropriately vaccinated

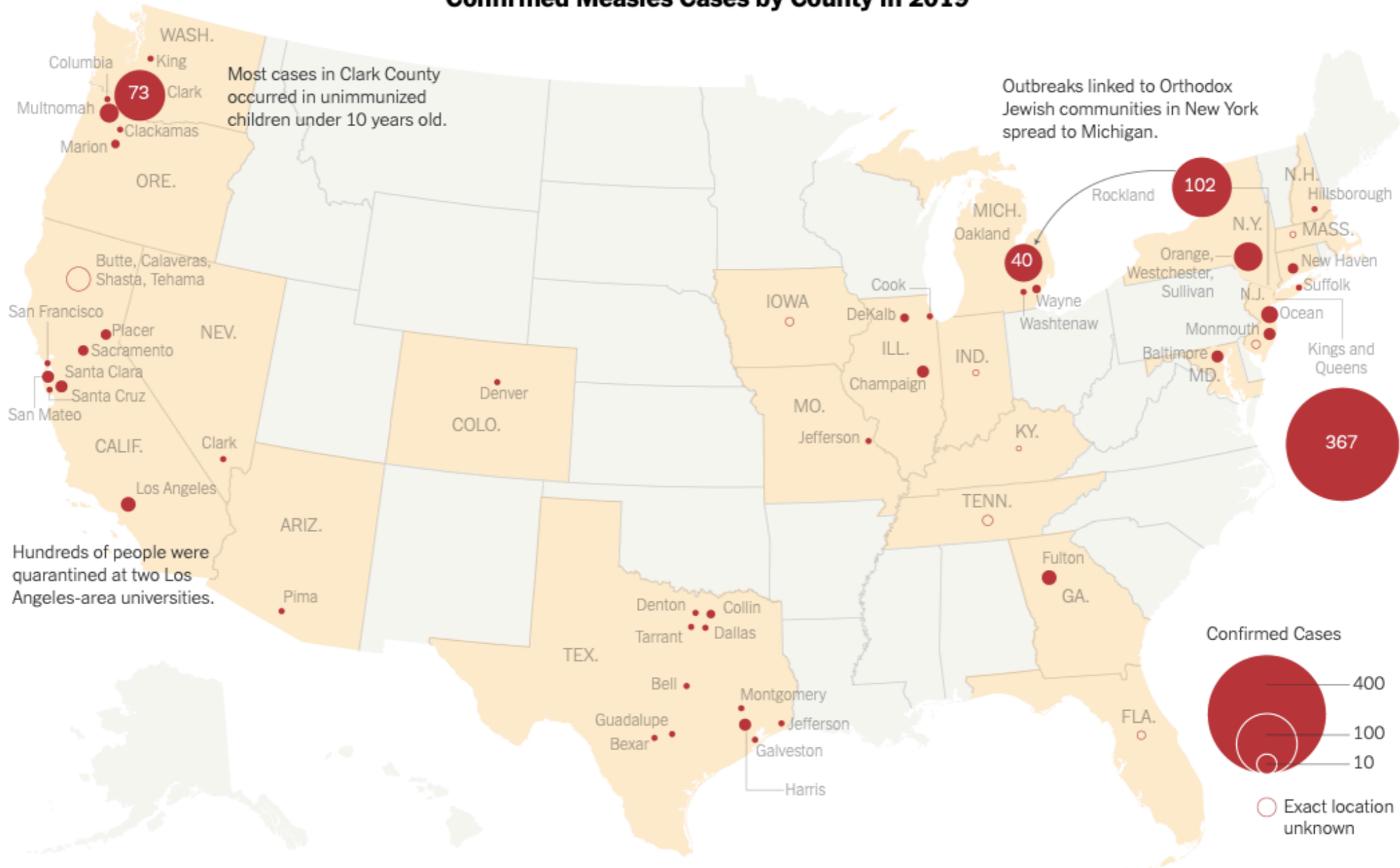
# NUMBER OF MEASLES CASES REPORTED BY YEAR

2010–2019\*\* (as of April 19, 2019)



\*\*multiple outbreaks; multiple states

### Confirmed Measles Cases by County in 2019



Source: Latest data available from state health departments, as of April 29. • By Weiyi Cai, Denise Lu and Scott Reinhard

13 outbreaks; 22 states (as of 4/29)



<https://www.nbcnews.com/health/kids-health/measles-outbreak-raging-europe-could-be-brought-u-s-doctors-n922146>

## Measles outbreak raging in Europe could be brought to U.S., doctors warn

Oct. 20, 2018

For Immediate Release



**NEWS RELEASE**  
L. BROOKS PATTERSON, OAKLAND COUNTY EXECUTIVE

Leigh-Anne Stafford, MSA  
Health Officer

### Health Officials Advise about Potential Measles Exposure

November 6, 2018, Pontiac, Mich. – Oakland County Health Division received confirmation from Michigan Department of Health and Human Services about two measles cases in Oakland County residents. The cases arrived on a flight at Detroit Metro Airport (DTW) on Oct. 23 at approximately 5:00 p.m. Oakland County officials advise individuals who were possibly exposed to watch for symptoms for 21 days after the exposure. **If symptoms develop, it is crucial to call ahead to the healthcare provider you plan to visit so they can take proper precautions to prevent exposure to other individuals.**

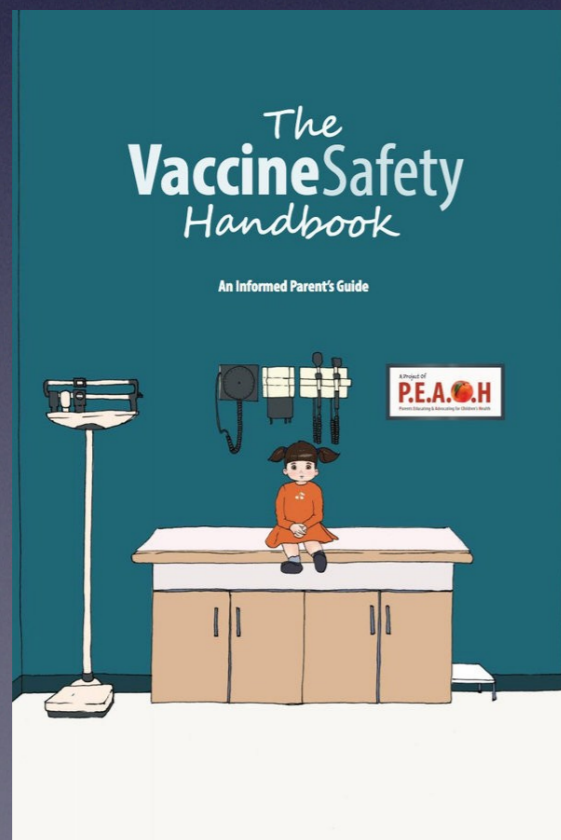
Nov. 6, 2018

A cluster of measles cases has been confirmed in Southeast Michigan. The cases are connected to an outbreak in Israel with subsequent disease transmission in Michigan. The index case traveled through Detroit-Wayne County Metropolitan Airport on October 23 when infectious. This underscores the importance of ensuring immunity to measles in all persons and especially international travelers.

Nov. 9, 2018

<https://www.msn.com/en-us/health/medical/measles-outbreak-in-ny-a-clear-and-present-danger/ar-BBRXAfM?li=BBnbfcl>

## Measles outbreak in NY a 'clear and present danger'



Jan. 9, 2019; 64 cases  
mostly Orthodox Jews in Brooklyn

<https://www.nbcnews.com/storyline/measles-outbreak/measles-outbreaks-make-2018-near-record-year-u-s-n961276>

## **Measles outbreaks make 2018 a near-record year for U.S.**

Jan. 22, 2019, 12:44 PM EST

Health officials in one county near Portland, Oregon have declared a public health emergency because of an outbreak of measles that has infected 22 people so far. An [outbreak among Orthodox Jews](#) has led to 177 cases in New York, helping make 2018 the second-worst year for measles since 2000, according to the Centers for Disease Control and Prevention.

Jan. 22, 2019

<https://www.nbcnews.com/health/health-news/nba-fans-who-attended-trail-blazers-game-portland-may-have-n961991>

## **NBA fans who attended Trail Blazers game in Portland may have been exposed to measles, officials warn**

Health officials in nearby Vancouver, Washington, said there have 23 confirmed cases of measles.

Jan. 23, 2019, 7:52 PM EST

Jan. 23, 2019

<https://www.clickondetroit.com/health/good-health/cdc-raising-concerns-over-increasing-number-of-measles-cases>

## **CDC raising concerns over increasing number of measles cases**

Michigan allows parents to opt out of vaccinating children

Feb. 1, 2019

# ***'A Match Into a Can of Gasoline': Measles Outbreak Now an Emergency in Washington State***



Feb. 7, 2019

**For Immediate Release**



## **Measles outbreak continues, cases reach 41 in Michigan**

**Measles outbreak continues, cases reach 41 in Michigan**  
*Washtenaw County reports first case*

**FOR IMMEDIATE RELEASE:** April 8, 2019

Many of these cases traced back to New York outbreak

# 2019 Michigan Data (as of April 22nd)

- 43 cases
  - of the 25 cases w/ known immunization hx:
    - 6 had previously received two doses of vaccine
    - 6 were apparently post-exposure prophylaxis (PEP) failures
    - 13 had not been immunized
  - No additional data provided e.g., severity, complications, secondary transmission, etc.

# 2019 National Data

(as of April 29nd)

- 704 cases
  - 503 not vaccinated
  - 76 vaccinated (unknown how many received only one dose)
  - 125 unknown vaccine status

# So, who is this country gets measles?

- “Anti-vaxers” (see also recent case of tetanus in Oregon) resulting in vaccination exemptions for personal, medical, religious beliefs, etc
- Those whose medical condition or young age preclude immunization
- Non-immune travelers
- Non-immune individuals around any of the above
- Occasionally, vaccinated individuals



# Myths around Measles (and other) Vaccines

- Measles is no big deal
- Measles (and other) vaccines lead to autism
- Measles can be treated with antibiotics
- Naturally acquired measles can protect you against cancer in later years

<https://www.nbcnews.com/storyline/measles-outbreak/measles-vaccination-saves-you-more-measles-n355501>

## **Measles Vaccination Saves You From More Than Measles**

by Maggie Fox Mar 6 2018, 4:16 pm ET

Here's another reason to get vaccinated against measles – researchers have found the measles virus makes kids' immune systems “forget” most of what they have learned, leaving children vulnerable to other diseases for as long as three years.

***“If you get measles, three years down the road, you could die from something that you would not die from had you not been infected with measles.”***

March 6, 2018

# FAQs

- How effective are 2 doses of vaccine offered to all those born in 1957 or later? Problem: effective vaccine not available and until 1971. Second dose not recommended until 1989. Who kept these records? What to do???????
- If I have been immunized, do I still need to wear an N95 mask when caring for a patient with suspected measles
- If I do get measles after being immunized, how does that impact the severity? What about contagiousness?\*
- Do I ever need a booster? Is a booster harmful?
- What if I may have been exposed to measles and have no clue as to my vaccine status?
- Where should I go, what should I do if I think I have measles?

\*Cherry JD and Zahn M. CID 2018;67:1315-1319

## Other, Not So FAQs:

- Is there a difference in long term immunity between naturally-acquired measles and vaccine-induced immunity?\*
- Multiple genotypes of measles are described. Are they significantly different in any way e.g. vaccine efficacy, virulence, etc?
- Beyond malnutrition, what host factors are important in response to measles?
- Why is MMR so expensive?

\*Cherry JD and Zahn M. CID 2018;67:1315-1319

## Other stuff to know:

- What if I know that I've received two doses of MMR, and I still have no detectable titer?
- What if I've been potentially been exposed and I think I'm pregnant?
- What if I just received a dose of MMR because of a potential exposure, and I now find out I'm pregnant
- How useful is serology in making the diagnosis of measles? What about evaluating potentially exposed individuals?

# The Take Homes:

- Measles, though still uncommon in the U.S., is still all too common throughout much of the world. Unfortunately, it is on the rise in places where it previously would have been nearly unheard of
- Measles is nearly 100% preventable. When in doubt about your status, either obtain a titer, or just get immunized
- Immunization against measles is safe. (Also true for multiple other vaccines). Looked at extensively, there is no association w/ autism
- Like most all other illnesses, not all presentations of measles are “classical”

# The Take Homes:

- In a perfect world, the worst place you could send a patient with suspected measles is to the hospital
- The newly appreciated severe impact on the immune system (for up to three years!) adds even more argument for immunization

# The Take Homes:

- My opinion:
  - it is morally unacceptable that individuals in many parts of the world to not have access to this vaccine
  - for those who do have access, to decline the vaccine means, at best, that you are misinformed. It also means that you have put others at risk unnecessarily





- “When the Next Big One arrives.....it will be signaled first by quiet, puzzling reports from faraway places - reports to which disease scientists and public health officials, but few of the rest of us, pay close attention.” - D. Quammen. NYT 5/9/13

# Today's "Guests"

- Timothy Barreiro DO, FACOI (Pulmonary/Critical Care)
- Annette Carron DO, FACOI (Palliative Care)
- MarkAlain Dery DO, FACOI (Infectious Disease)
- Rick Greco DO, FACOI (Internal Medicine)