

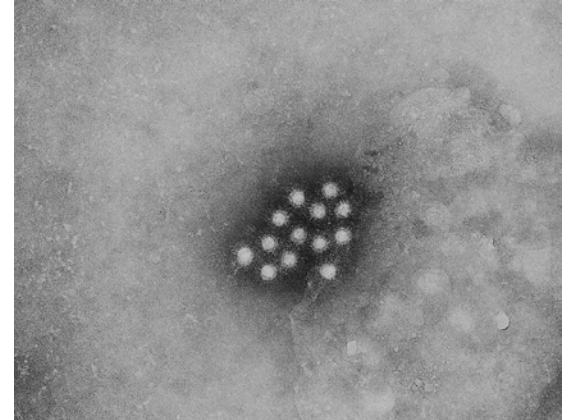
Hepatitis A Outbreak in Arkansas: 2018-19

Nathaniel Smith, MD, MPH
Director and State Health Officer
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National Vaccine Advisory Committee
March 25, 2019

Hepatitis A Virus

- RNA Picornavirus
 - Single serotype worldwide, despite multiple genotypes
- Acute disease and asymptomatic infection
- No chronic infection
 - Protective antibodies develop in response to infection and confer lifelong immunity



Hepatitis A is caused by HAV, a 27-nm ribonucleic acid (RNA) agent that is classified as a picornavirus. Only one serotype has been observed among HAV isolates collected from various parts of the world. HAV causes both acute disease and asymptomatic infection. HAV does not cause chronic infection. Total antibody to HAV develops in response to infection and confers lifelong immunity from future HAV infection.

Hepatitis A – Clinical Features

- **Classic Symptoms** fever, reduced appetite, nausea, vomiting, abdominal pain
- **Jaundice by age group:**

<6 yrs	<10%
6-14 yrs	40%-50%
>14 yrs	70%-80%
- **Rare complications:**
 - Fulminant hepatitis (death)
 - Cholestatic hepatitis
 - Relapsing hepatitis
- **Incubation period:**
 - Average 30 days
 - Range 15-50 days
- **Chronic sequelae:** None

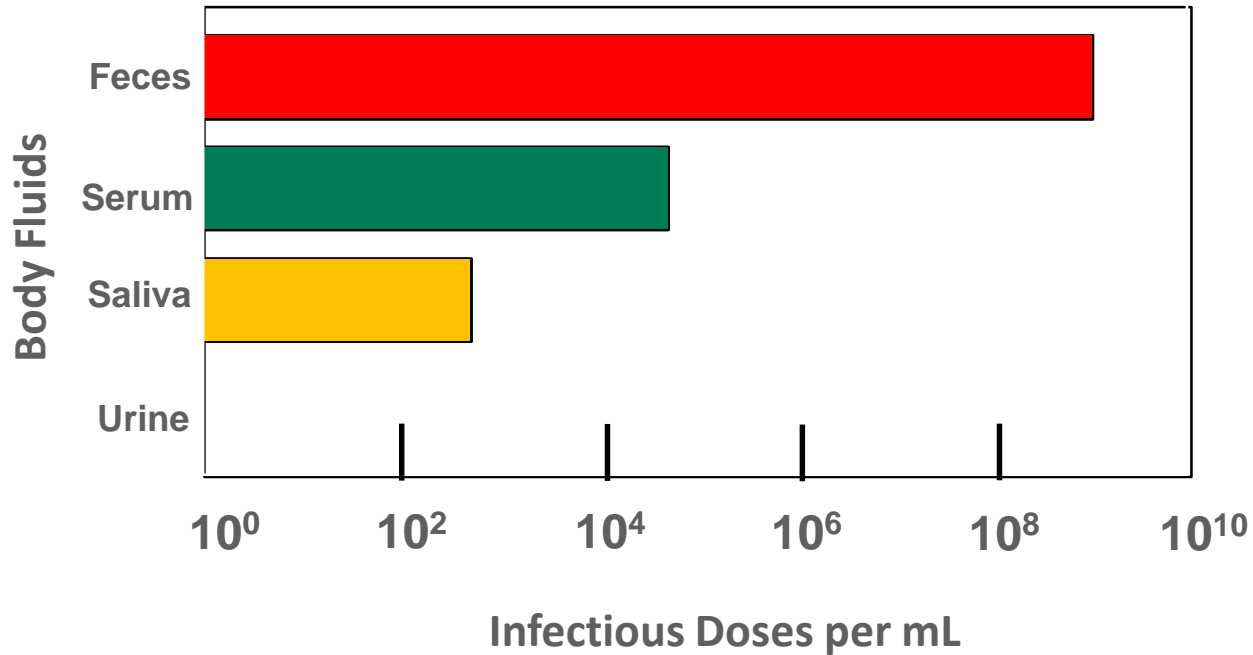
The average incubation period for hepatitis A is 30 days, with a range of 15 to 50 days. Patients characteristically have abrupt onset of symptoms which can include fever, malaise, anorexia, nausea, abdominal discomfort, dark urine, and jaundice. The severity of clinical disease associated with HAV infection increases with increasing age; jaundice occurs among less than 10% of children younger than 6 years of age, 40%-50% of older children, and 70%-80% of adults. Complications of hepatitis A include fulminant hepatitis, in which the case fatality rate can be greater than 50% despite medical interventions such as liver transplantation; cholestatic hepatitis, with very high bilirubin levels that can persist for months; and relapsing hepatitis, in which exacerbations can occur weeks to months after apparent recovery. Chronic infection does not occur following HAV infection.

Hepatitis A Virus Transmission

- **Close personal contact**
(e.g., household contact, sexual contact, child day-care centers)
- **Contaminated food, water**
(e.g., infected food handlers)
- **Blood exposure (historically thought to be uncommon)**
(e.g., injection drug use, rarely by transfusion)

Transmission of HAV generally occurs when susceptible persons put anything in their mouths that has been contaminated with the feces of an infected person. Close personal contact is the most common mode of HAV transmission, as demonstrated by infections among household and sex contacts of persons with hepatitis A and among children in day-care center outbreaks. Contaminated food and water can also serve as vehicles of HAV transmission. HAV transmission can occur when an infected food handler directly handles uncooked or cooked foods. Outbreaks have also been reported in association with foods contaminated before wholesale distribution, such as fresh vegetables contaminated at the time of harvesting or processing. HAV transmission can occur as a result of blood exposures such as injecting drug use or blood transfusion because viremia can occur prior to the onset of illness in infected persons. Screening of blood products for HAV has essentially eliminated the already extremely low risk associated with transfusion.

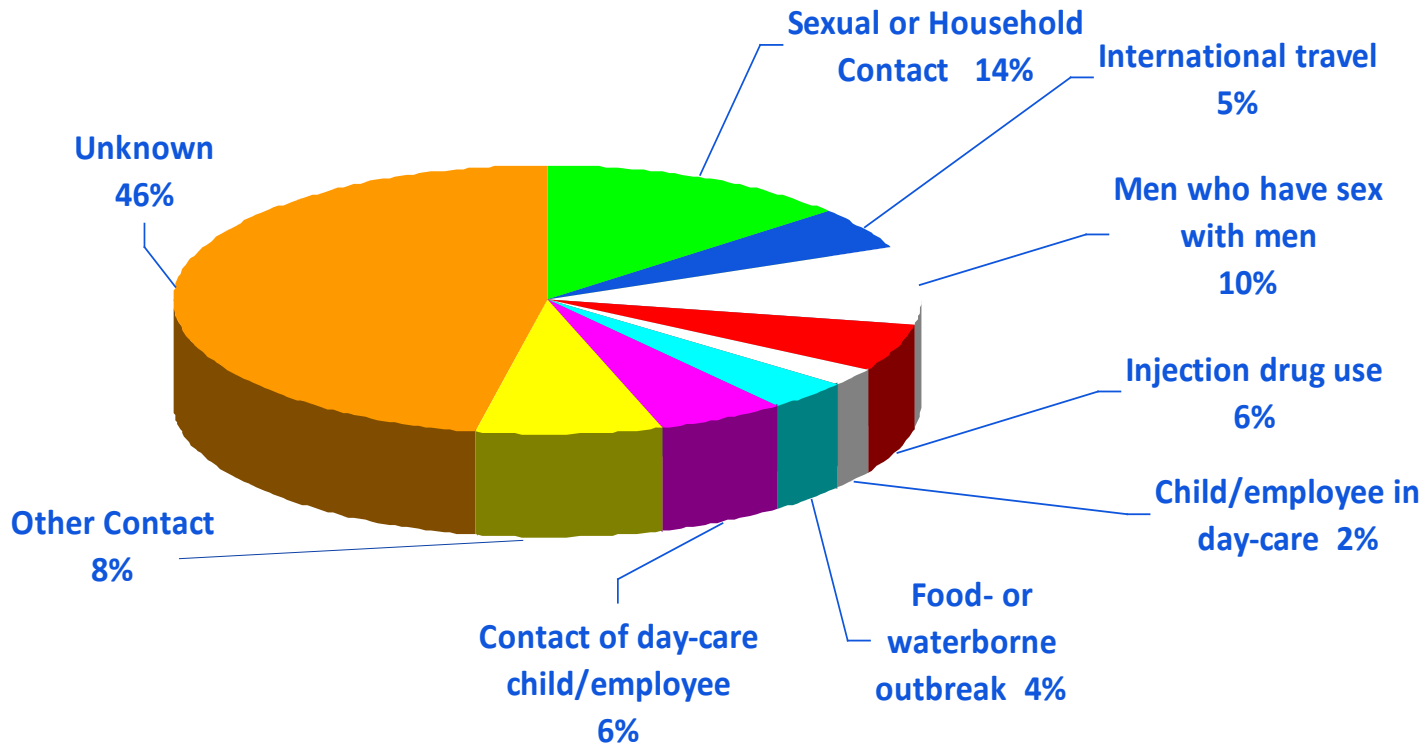
Concentration of Hepatitis A Virus in Various Body Fluids



Source: Viral Hepatitis and Liver Disease 1984;9-22
J Infect Dis 1989;160:887-890

Feces can contain up to 10^8 infectious virions per milliliter and are the primary source of HAV. Viremia occurs during the preclinical and clinical phases of illness, and HAV has been transmitted by transfusion (before screening of blood and blood products for HAV was initiated) and by injection drug use. Virus has also been found in saliva and urine during the incubation period in experimentally infected animals, but transmission by saliva or urine has not been reported to occur.

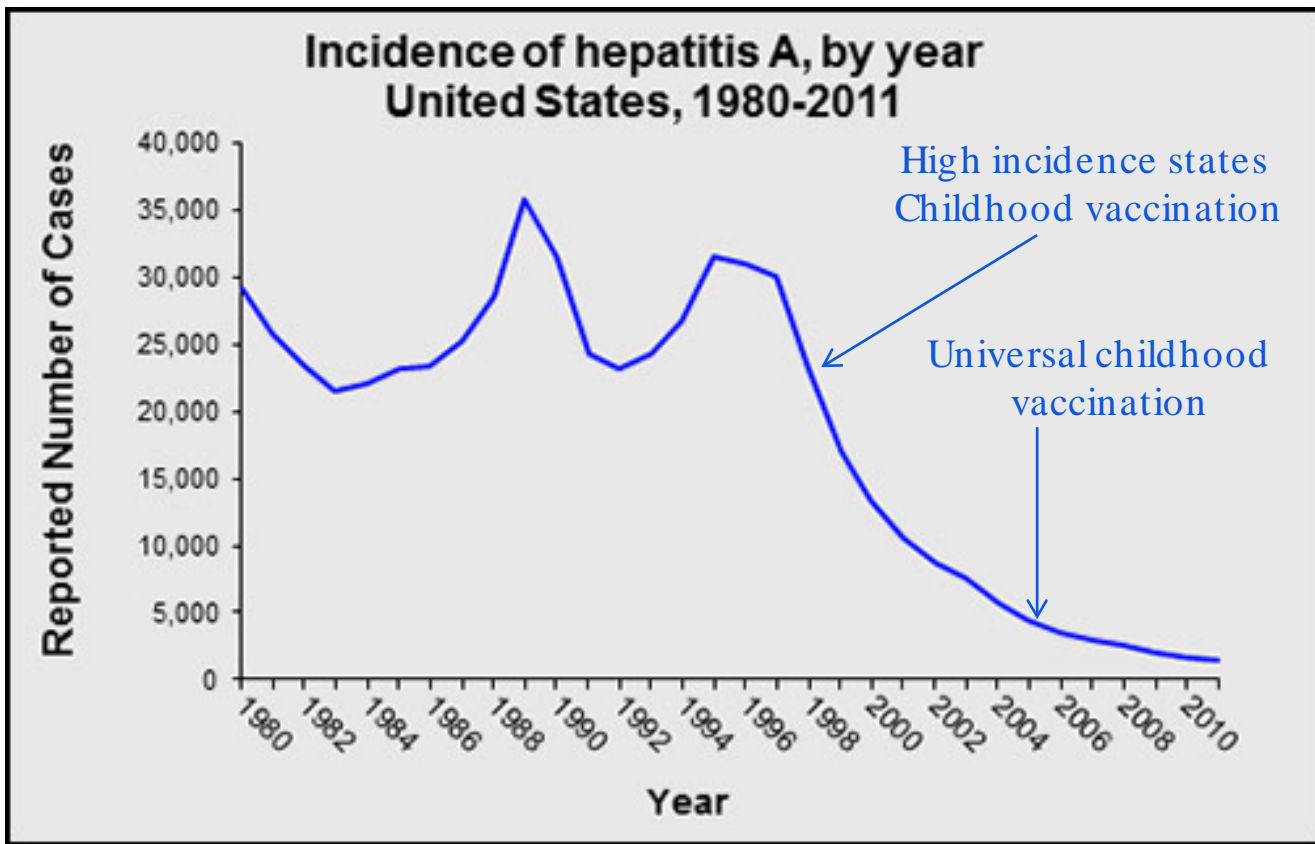
Hepatitis A Virus Transmission



Source: NNDSS/VHSP

From 1990 through 2000, the most frequently reported source of infection was personal contact (household or sex) with an infected person (14%). Two percent of cases involved a child or employee in day-care; 6% of cases were a contact of a child or employee in day-care; 5% of cases reported recent international travel; and 4% of cases reported being part of a recognized foodborne outbreak. Injection drug use was a reported risk factor in 6% of cases; men who have sex with men represented 10% of cases. Forty-six percent of reported hepatitis A cases could not identify a risk factor for their infection.

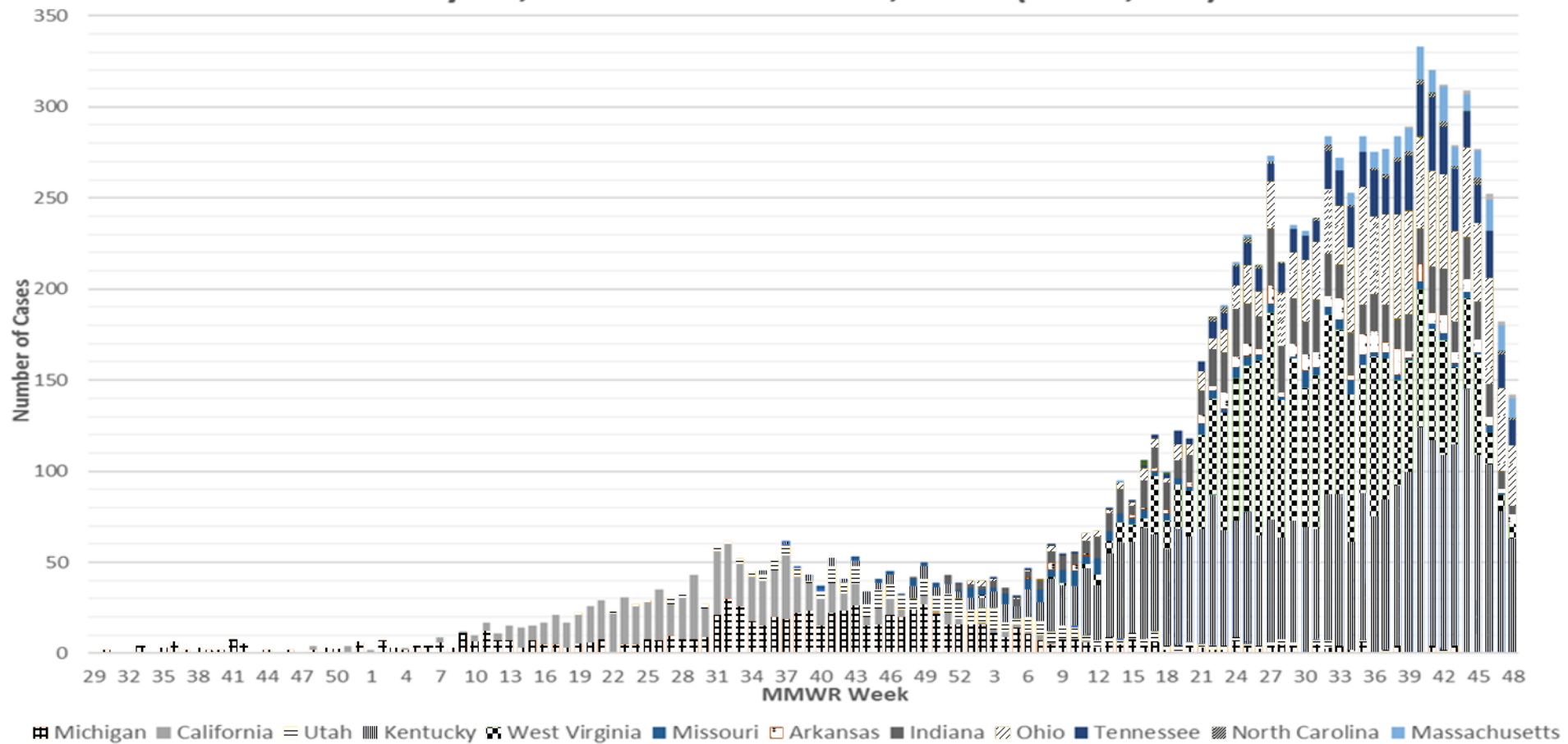
Note: Risk factor percentages rounded to nearest percent



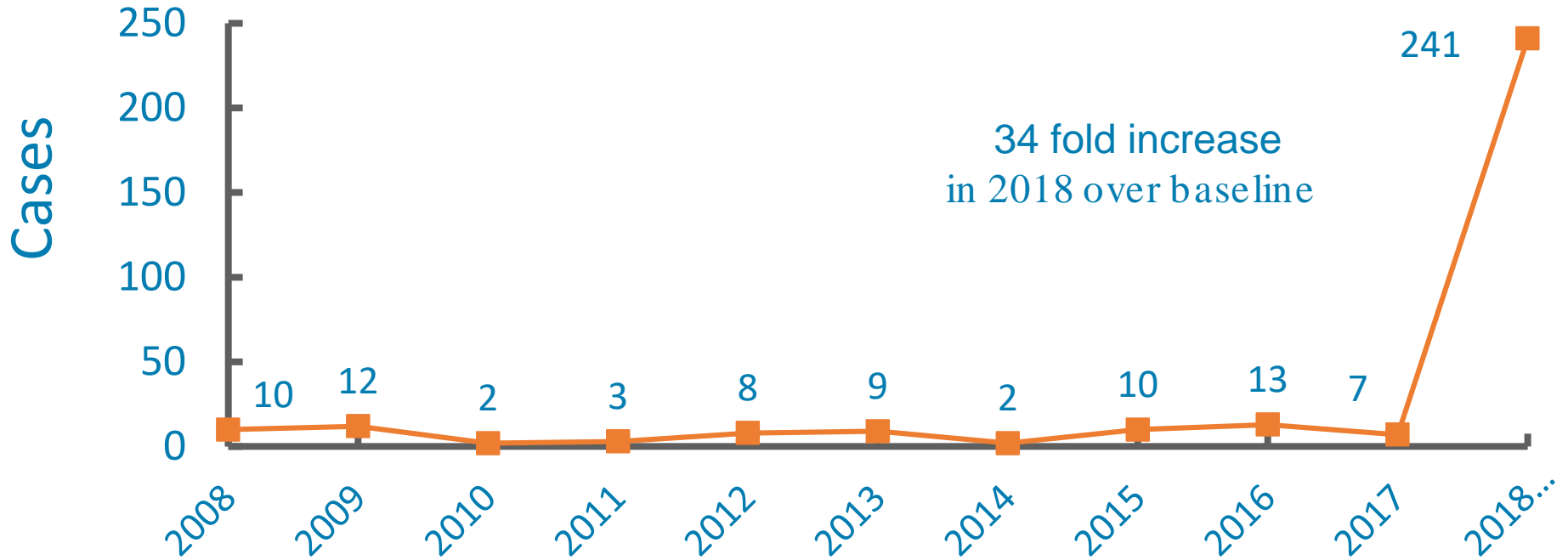
Source: CDC

In general, the incidence of hepatitis A in the United States has been cyclic, with nationwide increases occurring every 10 to 15 years (the last peak occurred in 1995). Hepatitis A vaccine, licensed in 1995, is now used in hepatitis A childhood immunization programs in all parts of the United States. Hepatitis A rates have been declining since 1995, and since 1998 have been at historically low levels. The wider use of vaccine is probably contributing to this marked decrease in hepatitis A rates in the United States.

Hepatitis A Cases by MMWR Week, July 27, 2016 - December 1, 2018 (N=10,037)



Hepatitis A Cases in AR, 2008-2018



Hepatitis A Cases, by County

February 2018

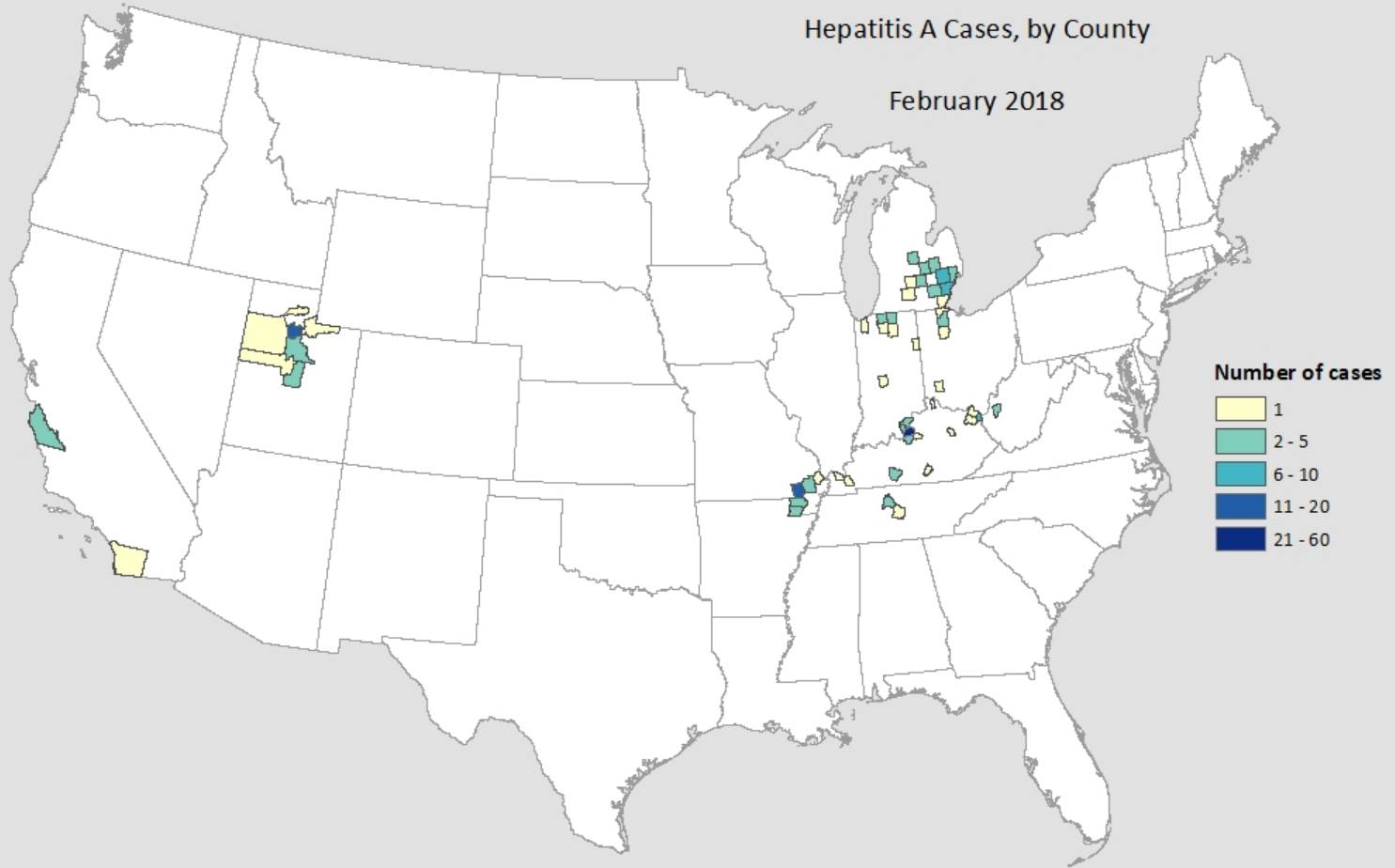


Figure 2: Hepatitis A Cases by Week, February 2018 - March 2019

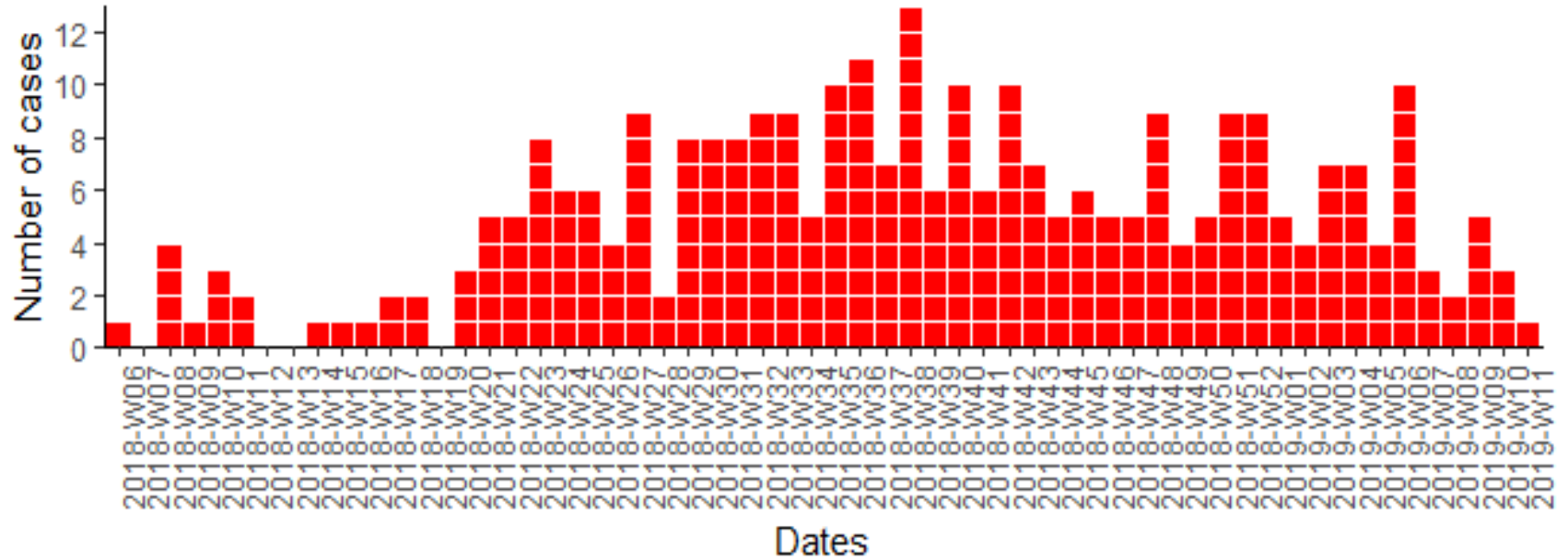


Table 1: Demographic Characteristics of Hepatitis A Cases

*Percents may not add to 100% due to missing data

Characteristic	n	Percent
Men	194	64
Women	103	34
Pregnant Women	1	1
Black or African American	8	3
White	278	92
TOTAL CASES	301	100

Table 2: Risk Factors and Clinical Characteristics Among Cases of Hepatitis A

Characteristic	n	Percent
Number Who Use Drugs	179	59
Number who Inject Drugs	95	55
Number who Shared Injection Equipment	3	3
Number of Food Handlers	15	5
Number Co-infected With Hepatitis C	80	27
Number Co-infected With Hepatitis B	14	5
Number Hospitalized	148	49
Number of Men Who Have Sex With Men	3	2
Number Jailed Past 2 Months	14	5
Number of Homeless Individuals	8	3

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ADH Activities

- **Monitoring the local and national outbreak trends**
- **Provider education**
- **Stakeholder engagement**
- **Public communication**
- **Secured additional grant money for response**
- **Provision of vaccine for free**
 - **Targeting high risk groups**
 - **Novel approaches (EMS, Emergency Depts)**
- **Recurring clinics in jails, shelters, food pantries, addiction treatment facilities**
- **Post exposure clinics in restaurants, schools, and other settings**

Summary of Vaccination Efforts

- 31 mass clinics in 13 counties
 - ~13,000 vaccinated in Greene County
 - ~7,600 vaccinated in Craighead County
- 22 clinics in jails
 - 1102 vaccinated
- ~30,000 vaccines delivered by ADH staff

Hepatitis A among Food Handlers

- 15 cases among food handlers (5% of total cases)
- 19 mass vaccination clinics due to food handler exposure
 - 14,493 vaccinated due to food handler exposure
- ~600 restaurants and food services visited by Environmental Health Specialists and Communicable Disease Nurse Specialists to provide education regarding hepatitis A and promote vaccination of food handlers
 - >515 food service workers vaccinated for hepatitis A

Rural Challenges

- Initial cases were identified in a county with a population of <15,000, primarily among the homeless and persons who use recreational drugs.
 - lack of traditional homeless shelters
 - limited access to medical care, including addiction care
 - no syringe service programs
- The high-risk population is both more difficult to identify in this area as well as more stigmatized due to the small community size.
- About a third of cases have been identified as contacts to other cases but have either refused vaccination or did not seek out vaccination after exposure.

Resources & Vaccine Access

- Resources:
 - Staff and vaccine pulled from other counties
 - 317 funds used for vaccine purchase (38,000 doses)
 - Medicaid and private insurance billed for immunizations
 - ELC supplementary outbreak funding (\$160,000)
- Early in the multi-state outbreak of hepatitis A, vaccine availability was a concern, which limited our ability to preemptively vaccinate at-risk individuals in counties adjacent to those experiencing cases.
- Concerns about the availability of vaccine have since abated.

Lessons Learned

- Engaging high risk individuals, such as those who use drugs, continues to be a challenge for this particular outbreak.
- Limited resources for these high risk individuals exist in this area, including substance abuse treatment centers, homeless shelters, and syringe service programs.
- Because of this, outreach efforts have been challenged to reach this particular population prior to infection.
- Given the lack of resources in this region and throughout the state, outbreaks of similar pathogens affecting the same populations could become more frequent and more consequential as drug use and injection drug use continue to increase.

What do we expect?

- Several more months of elevated levels of hepatitis A
- A new normal of hepatitis A endemicity in the country and potentially the state
- Potentially some policy changes regarding immunizations for food workers
- Hopefully, a renewed commitment to improve the health care system with regard to adult immunizations

Acknowledgements

- **Dirk Haselow, MD, PhD**, State Epidemiologist & Medical Director for Outbreak Response, Arkansas Department of Health
- **Mike Cima, PhD**, Chief Epidemiologist, Preparedness & Outbreak Response, Arkansas Department of Health
- **Sarah Labuda, MD, MPH**, Epidemic Intelligence Service Officer, CDC/ADH
- **Katie White**, Director of Health Promotion, Office of Health Communication, Arkansas Department of Health

Measles Outbreak: 2018-2019, New York City

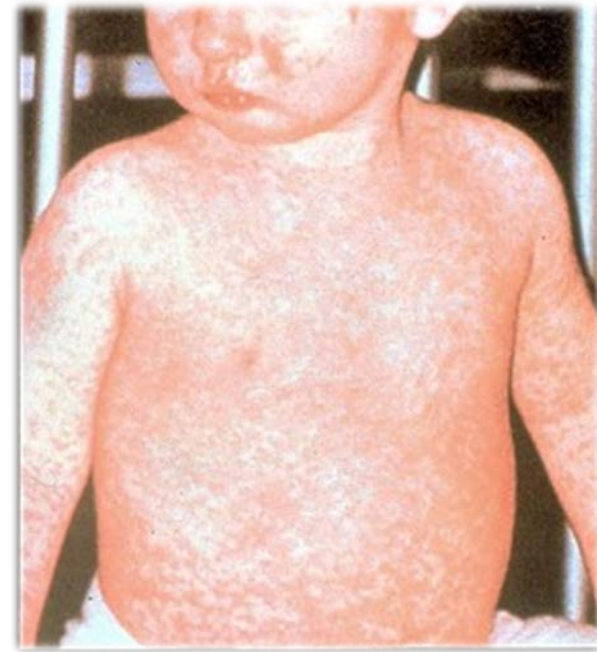
Jane R. Zucker, MD, MSc, FIDSA
Assistant Commissioner
Bureau of Immunization

NYC Department of Health and Mental Hygiene

March 25, 2019
National Vaccine Advisory Committee

Measles 101

- Viral infection characterized by fever and rash
- Highly contagious
 - 90% attack rate in close contacts
- Airborne and droplet transmission
- Incubation period (time from exposure to illness)
 - 7 to 21 days after exposure
- Infectious period
 - 4 days before through 4 days after rash onset



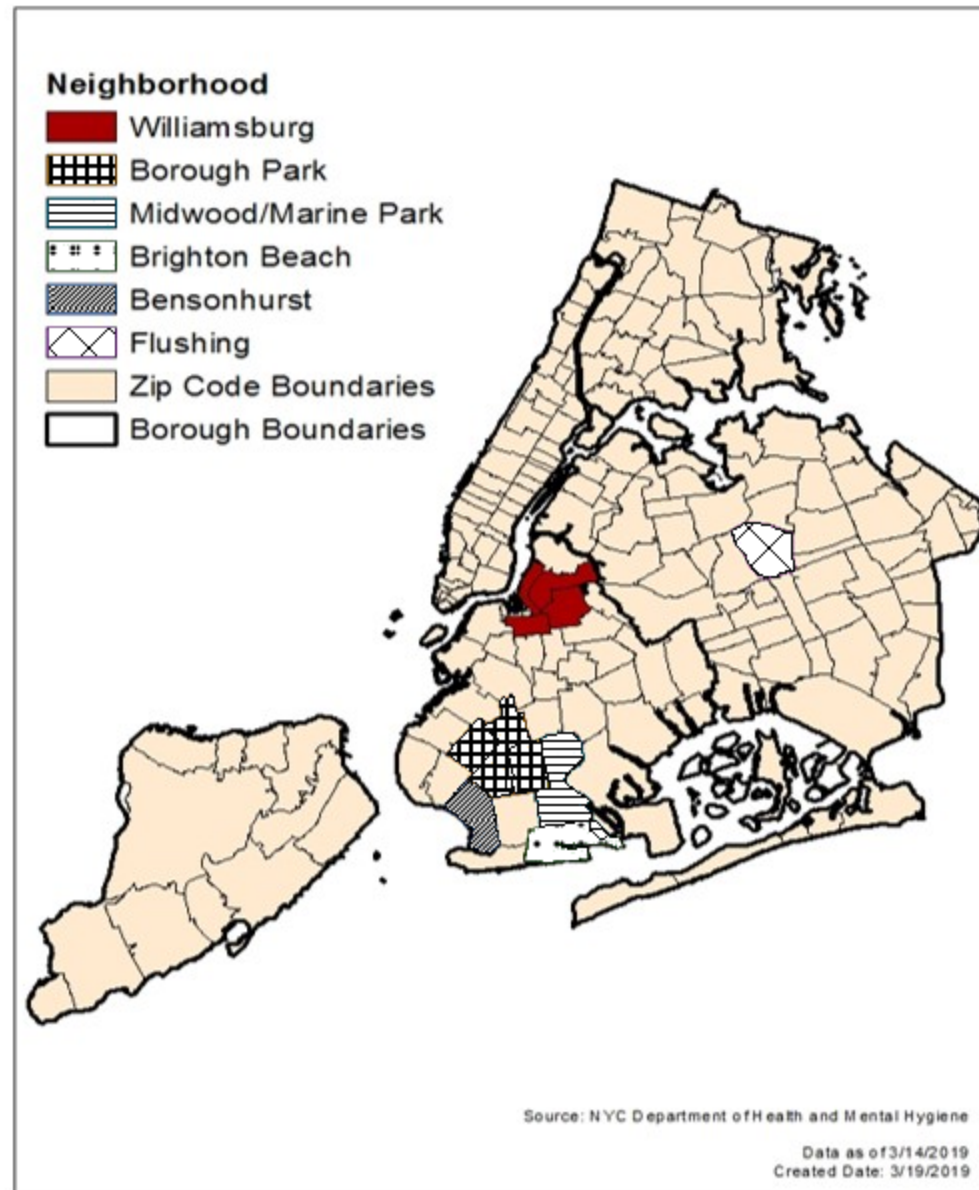
Measles, New York City, 2013-2019*

Year	Confirmed cases	Contacts investigated
Oct 2018-March 2019*	181	>8,900
2017	2	278
2016	1	431
2015	6	1169
2014	27	2404
2013	62	2575

*As of March 18, 2019

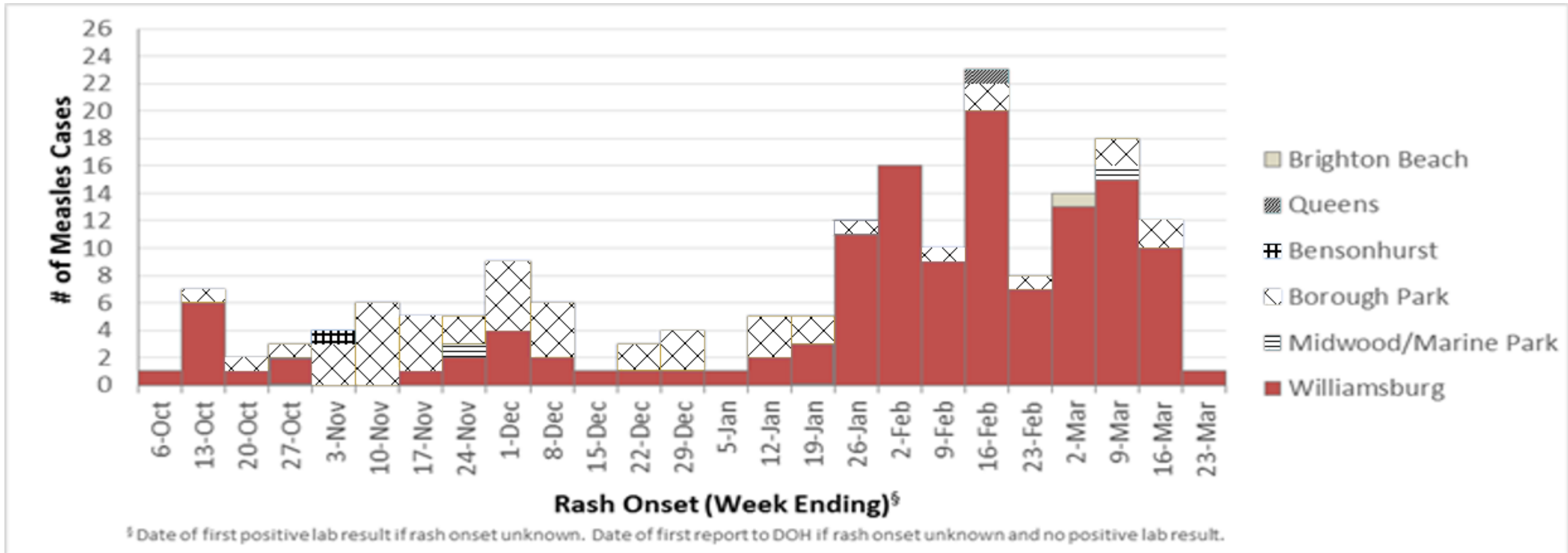
Measles Outbreak, 2018-19, New York City

- Rash onset of first case was 9/30/18
- Centered in two Orthodox Jewish neighborhoods in Brooklyn



Measles Outbreak, New York City, 2018-19: Epi Curve by Rash Onset and Neighborhood*

N=181 cases



* Bensonhurst (1), Brighton Beach (1), Borough Park (46), Midwood/Marine Park (2), Williamsburg (130), Flushing, Queens (1) as of 3/18/19

Measles Outbreak, New York City, 2018-19: Age and Vaccination History

Age Category	# No MMR	# 1 Prior MMR	# 2 Prior MMR	# MMR Not Known	Total
<1 year	28	1	0	0	29
1 to 4 years	88	9	0	1	98
5 to 18 years	28	1	1	0	30
>18 years	1	0	3	20	24
Total (%)	145 (80%)	11	4	21	181

Median Age: 3 years (Range: 4 months to 59 years)

Complications

- Hospitalizations: 11
- Pneumonia: 7
- Otitis media: 23
- Diarrhea: 22

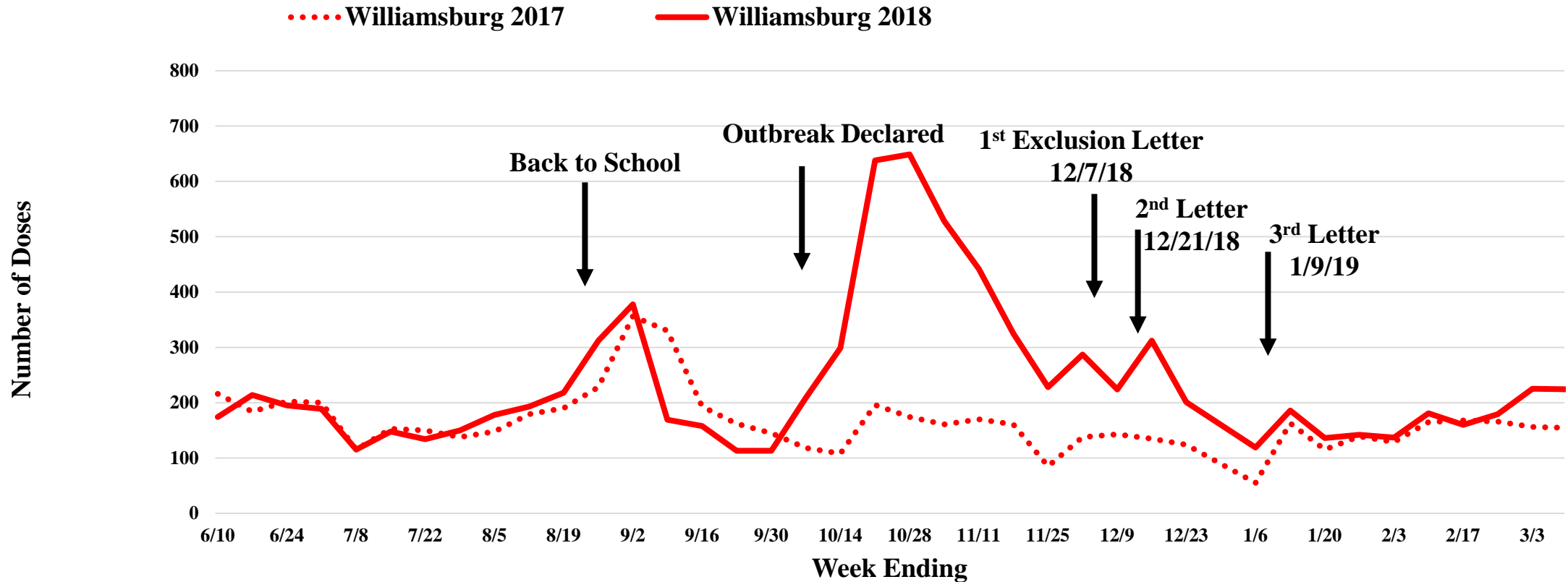
Outbreak Control Measures

- Notification of exposed contacts
- Post-exposure prophylaxis (PEP), MMR or IG, and/or home isolation as needed
- Alerts to providers citywide and targeted
- Recall of unvaccinated patients
- Press release and media interviews/articles
- Print ads and social media
- Daycare and school exclusions
- Community engagement

Use of Citywide Immunization Registry (CIR)

- Track MMR vaccine uptake
- Patient recall
- Check vaccination status of known contacts
- Ascertain demographic/contact information for exposed persons
- Identify persons residing in the same building as the case and extended household members
- Identify physicians for cases who did not present for medical care and for those who need PEP

MMR Vaccine Uptake Among Children <5 Years, Williamsburg, Brooklyn, NY



Since October 1, 2018, an additional

- **10,771** doses in NYC (15% increase)
- **2,969** doses in Williamsburg (95% increase)

have been given to children <5 years of age compared to the same time period last year.

Source: NYC DOHMH CIR
Data as of 3/8/2019



Outbreak Challenges

- >8,900 exposed contacts identified
 - Healthcare facilities: hospitals and outpatient
 - Schools and daycares
- Multiple identified chains of transmission
- 9 importations (Israel, UK, Ukraine, NJ, NYS)
- Vaccine hesitancy
- Cases not seeking medical care

Key Partnerships

- Providers serving this community
 - Increasing role of urgent care centers
- Agudath Israel – yeshivas
- Hatzalah – ambulance services
- Yeled v' Yaldah – service organization
- Orthodox Jewish Nurses Association (OJNA)
- Jewish media

Providers

- Critical partners
- Multiple communications
- Assist with recall
- Make sure they have enough MMR on hand
- Measures to prevent exposures
- PEP
- Posters
- Distribution of patient educational materials

Community Engagement

- Meetings with local religious, community and elected officials
- Letters sent to parents through schools
- Telephone hotlines
- Robocalls (three times, ~75,000 contacts)
- Partners (OJNA) holding small informational sessions with mothers
- Call center and immunization hotline

Community Engagement

- Focus on print and digital media serving the community
 - English and Yiddish
 - Measles symptoms and travel warning
 - Co-branded
- Distribution of materials and Tzim Gezint booklet through providers and local community-based organizations
 - Early Intervention, Head Start, WIC
 - Mailing of Tzim Gezint booklet to 29,000 households

Urgent Message to the Community

**ונשמרתם מאוד לנפשותיכם
לא תעמוד על דם רעיך**

Measles is a highly contagious disease that is now unfortunately prevalent in our community. Measles is transmitted by airborne particles, droplets, and direct contact with the respiratory secretions of an infected person.

Measles typically presents in adults and children as an acute viral illness characterized by fever and generalized rash. The rash usually starts on the face, proceeds down the body, and may include the palms and soles. The rash lasts several days. **Infected individuals are contagious from four days before rash onset through the fourth day after rash appearance.**

“Although measles is preventable, too many families are choosing to not vaccinate or delay vaccination, putting their children and other children at risk,” said Health Commissioner Dr. Oxiris Barbot. “It is also important to make sure the entire family is protected before traveling internationally, because outbreaks of measles are occurring in Israel and throughout Europe. If your child develops a fever and rash, contact your health care provider and keep your children home from school or daycare.”

If you think you or your child has been exposed to measles, contact your health care provider before going to the facility so they can prevent exposure to other patients. Tell the medical staff if you have fever and a rash and about any known exposures or international travel. You can prevent measles by making sure that you and your family have received two doses of MMR vaccine.

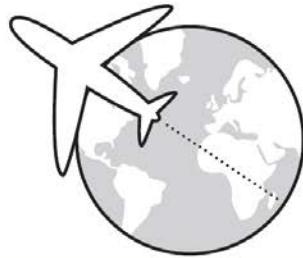
Chevra Hatzalah has seen an increase in measles cases in our community. In conjunction with the Department of Health we strongly urge everyone to be vaccinated for measles. The Health Department recommends the measles, mumps and rubella (MMR) vaccine for children at age 12 months, with a second dose at 4 to 6 years old. You are not only helping yourself, but you are helping prevent the spread of this disease to others who are not able to be vaccinated.

ATTENTION

MEASLES OUTBREAK IN ISRAEL:
GET VACCINATED!

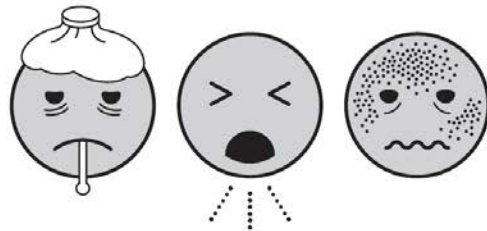
IF YOU

plan to **travel** to Israel, protect yourself
against measles and **get vaccinated**.



IF YOU TRAVELED AND YOU HAVE

**fever, cough, red eyes,
runny nose and body rash,**



**PLEASE CONTACT YOUR
DOCTOR IMMEDIATELY!**

אכטונג

עס איז דא א מיזעלס אויסברוך אין ארץ ישראל: ווערט וואקסינירט!

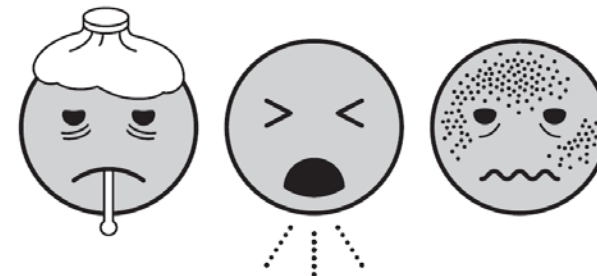
אויב איר:

פלאנירט צו רייזן קיין ארץ ישראל, באשיצט זיך אנטקעגן
מיזעלס און ווערט וואקסינירט.



אויב איר האט גערייזט און איר האט:

**פיבער, הוסט, רויטע אויגן, רינענדיגע
נאז און קערפער אויסשלאג,**



**ביטע פארבינדט זיך זאפארט
מיט אייער דאקטער!**

Op-Ed

Dying From Measles In 2018: The Anti-Vaccination Disgrace

By RABBI AARON E. GLATT, MD

There is a small, yet very vocal and influential group of “anti-vaxxers” living in our *heimishe* communities. They should stop reading now as they will not like or listen to what I have to say and will write personal non-scientific scathing diatribes against me. I hope the rest of *Klal Yisrael*, though, keeps reading this critically important *pikuah nefashos* article.

“Measles Outbreak in New York City in the Orthodox Jewish Community” was the title of a letter sent last week by the New York City Department of Health to physicians across the state. Unfortunately, this headline is only the latest tragic reaction to numerous preventable outbreaks in recent years in our communities in the U.S., *Eretz Yisrael* and Europe. I was truly saddened, embarrassed, and pained.

Almost all the cases of measles discussed in this letter were directly related to an unvaccinated person

of incorrect and dangerous medical views. *Hashem yerachem*.

There is absolutely no one who disagrees with the *psak* that a parent must remove his or her child to safety when danger is present. Indeed, this *psak* serves, in part, as the basis for the ruling of HaRav Yosef Shalom Elyashiv, *zt”l*, that providing normal childhood vaccinations is a parental obligation. HaRav Asher Weiss, *shlita*, *poseik* for Shaare Zedek Hospital, maintains it’s a *mitzvah* and *chiyuv* to get vaccinated.

HaRav Weiss further states that yeshivas have the right – and even obligation – to protect students and should not admit unvaccinated children. Both HaRav Yitzchok Zilberstein, *shlita*, as well as HaRav Elyashiv have ruled that parents may insist that

So why all the headlines, anguish, and outbreaks in *heimishe* circles? Why did 180 children – 80 percent of whom were unvaccinated – die in the U.S. in 2017-18 from the flu along with 80,000 adults? Why do yeshivas and camps have to close down and stop learning because of mumps outbreaks? Why were six babies hospitalized with measles in the past month at Ichilov Medical Center in Tel Aviv? Are we living in the 1950s?

In my humble opinion – as a community *rav* and board-certified infectious diseases physician expert – it is because we somehow have forgotten to follow basic *halacha*. *Halacha* states that if a dispute exists on whether a patient should eat on Yom Kippur, or Shabbos desecration is necessary to save a life, we follow the most competent and/or majority of ex-

Current Status and Risks

- Recent surge in cases related to exposures at one yeshiva
- Retrospective cases identified through serology
 - No opportunity to implement control measures
 - Parents looking to expose their children
- Nosocomial transmission and first two cases outside of the Orthodox community
- New importations from Israel to Queens and other neighborhoods in Brooklyn

Next Steps

- Maintain daycare and school exclusions and continue audits
- Lowered age for MMR to 6 months
- Increased efforts to prevent exposures and ensure timely notifications
 - Increased support to one FQHC
- Mobilize rabbinical leadership

Q & A

Thank you!

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