

# Lessons from the Measles Outbreak: 2018-2019, New York City

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I have no disclosures or conflicts of  
interest

# Measles 101



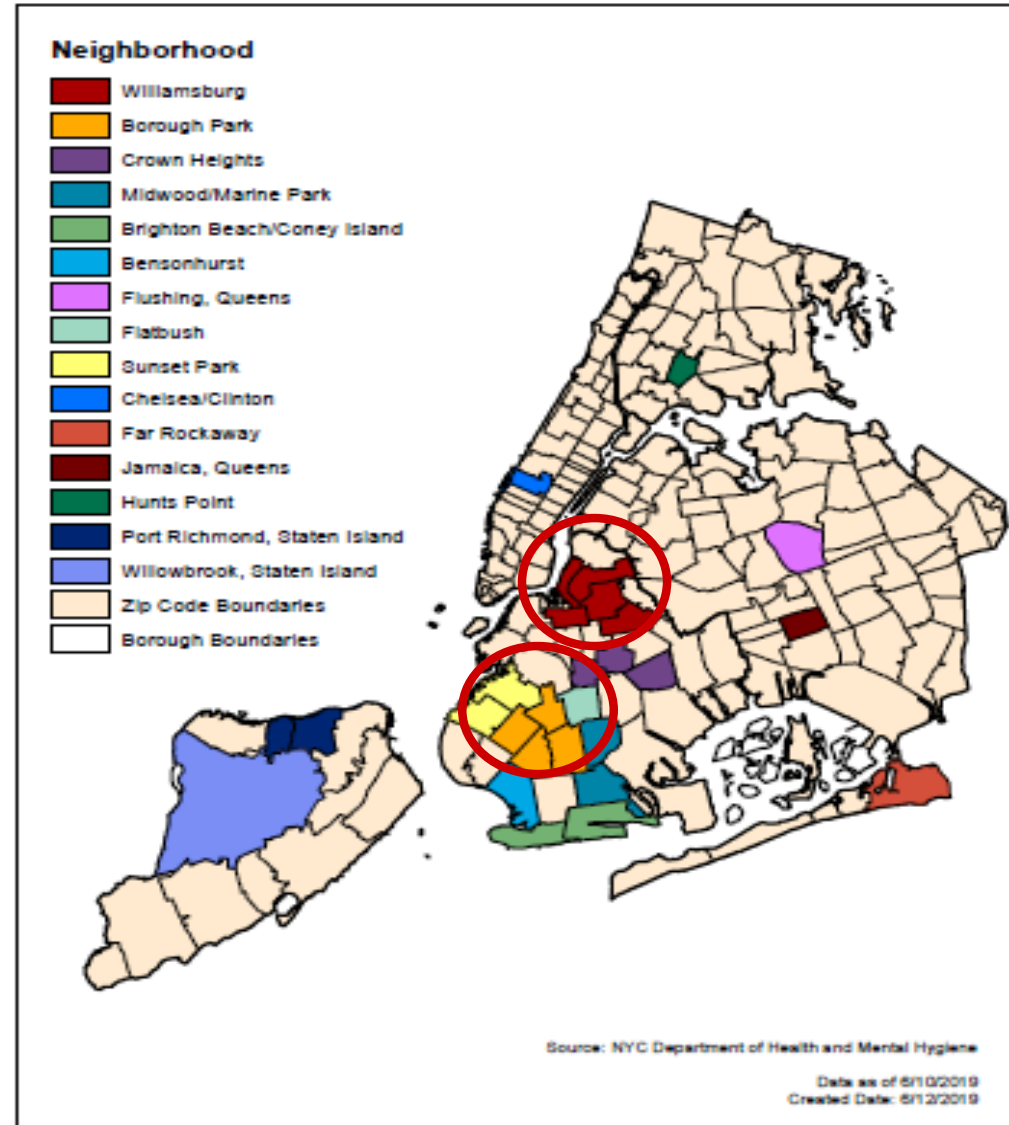
- Viral infection characterized by fever and rash
- Highly contagious
  - 90% attack rate in non-immune close contacts
- Airborne and droplet transmission
- Incubation period (time from exposure to illness)
  - 7 to 21 days after exposure
- Infectious period
  - 4 days before through 4 days after rash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

# Measles Outbreak: 2018-19, New York City

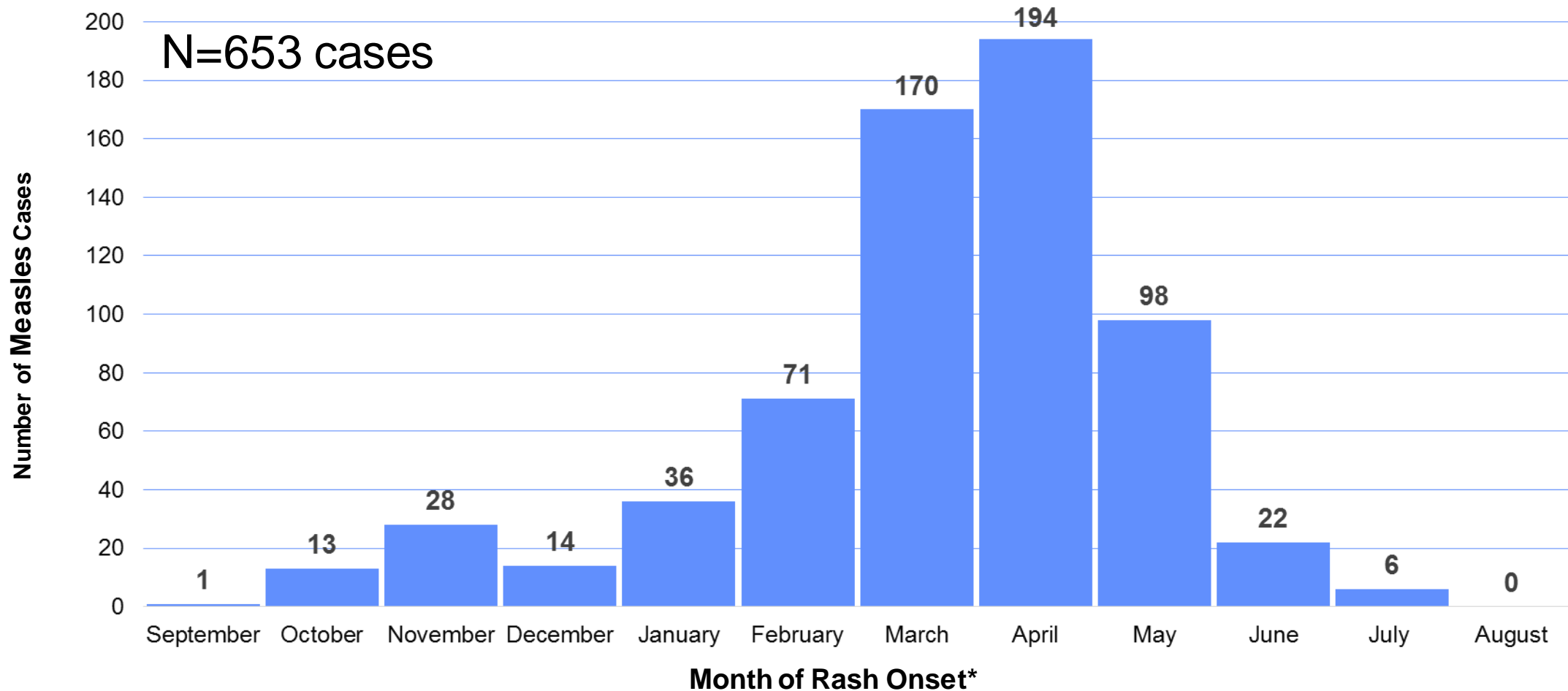
- Measles was declared eliminated in the U.S. in 2000
- New York City (NYC) has experienced periodic measles outbreaks due to importation of the virus by people who become infected while traveling outside of the US
- Current outbreak in NYC
  - Began on September 30, 2018 with an unvaccinated child from Brooklyn who acquired measles in Israel
  - Largest outbreak in the US since 1992
  - 653 cases as of August 13, 2019; >21,000 people exposed

# Map of Measles Outbreak: 2018-19, New York City

- Centered in two Orthodox Jewish neighborhoods in Brooklyn: Williamsburg and Borough Park



# Measles Outbreak, 2018-19, New York City: Confirmed Measles Cases by Month of Rash Onset



\* Date of first positive lab test if rash onset date unknown

Source: NYC DOHMH surveillance data, as of 8/12/19.

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

Age Category	No MMR	1 Prior MMR	2 Prior MMRs	# MMR Not Known	Total (%)
<1 year	99	2	0	0	101 (15%)
1 to 4 years	245	32	1	0	278 (43%)
5 to 18 years	129	5	10	3	147 (23%)
>18 years	4	7	20	96	127 (19%)
<b>Total (%)</b>	<b>477</b>	<b>46</b>	<b>31</b>	<b>99</b>	<b>653</b>

- Median Age: 3 years (Range: 1 month to 70 years)
- 86% of cases with known vaccine history, were unvaccinated

# Outbreak Control Measures

- Notification of exposed contacts
  - Post-exposure prophylaxis (PEP) with Measles-Mumps-Rubella (MMR) or immune globulin (IG)
  - Home isolation as needed
- Alerts to providers citywide and targeted
- Promoting MMR vaccination
- Press release and media interviews/articles
- Print ads and social media
- Community engagement
- Daycare and school exclusions
- Emergency order requiring vaccination



# Why Did This Outbreak Occur

- Vaccine hesitancy and delay in vaccination
  - Conducted focus groups in 2011
  - Religious exemptions
- Large outbreaks in Europe and Israel: multiple importations and chains of transmission
- Increased influence of anti-vaccine movement, deliberately targeting this community
- Large families, densely, populated and congregate settings
- Measles parties and not seeking medical care

# Targeted Efforts to Reach Community

- Reliance on partnerships
  - Providers
  - Hatzolah ambulance services
  - Jewish media
  - CBO/service providers (WIC, Head Start, Early Intervention)
- Emergence of new organizations
  - Jewish Orthodox Women's Medical Association (JOWMA)
  - Vaccine Task Force (Orthodox Jewish Nurses)
- Community mobilization, example, Borough Park event

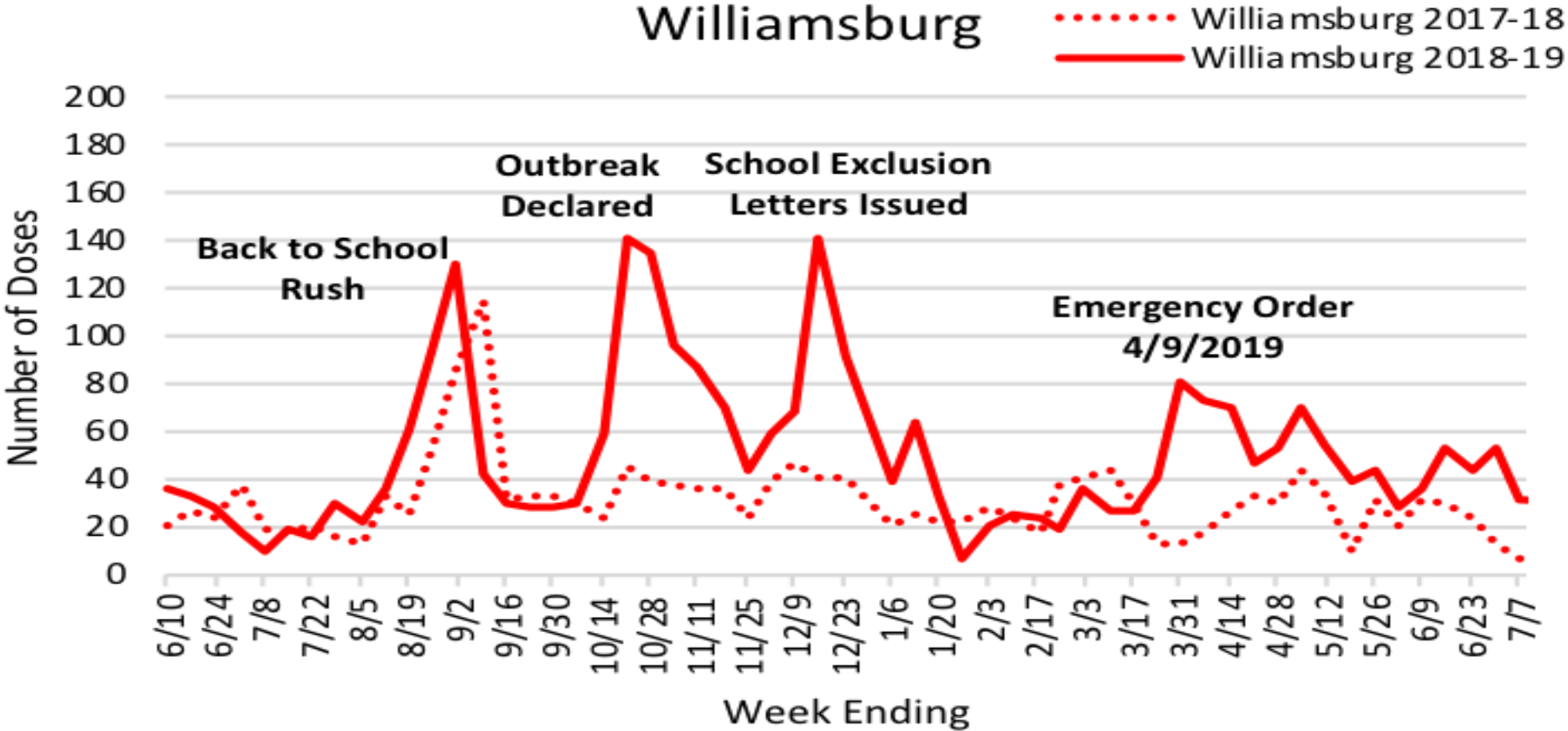
# Community Engagement

- Meetings with local religious, community and elected officials
- Letters sent to parents through schools
- Letters sent to households with unvaccinated children
- Robocalls (multiple times, ~75,000 contacts)
- Call center and immunization hotline
- Partners holding small informational sessions with mothers and/or hosting hotlines

# Community Engagement: Media and Education

- Focus on print and digital media serving the community
  - English and Yiddish
  - Measles symptoms and travel warning, MMR vaccination
  - Co-branded
  - WhatsApp
- Distribution of materials, Tzim Gezint booklet and Slice of PIE, through providers and local community-based organizations
  - Mailing to 29,000 households

# MMR Vaccine Uptake Among Children Ages 5 to 18 Years as of 7/7/2019



Source: NYC DOHMH Citywide Immunization Registry  
Data run on 7/9/2019



Interesting, but what does this have to do with  
HPV?

# HPV Vaccine Coverage Among Adolescents Ages 13-17 Years

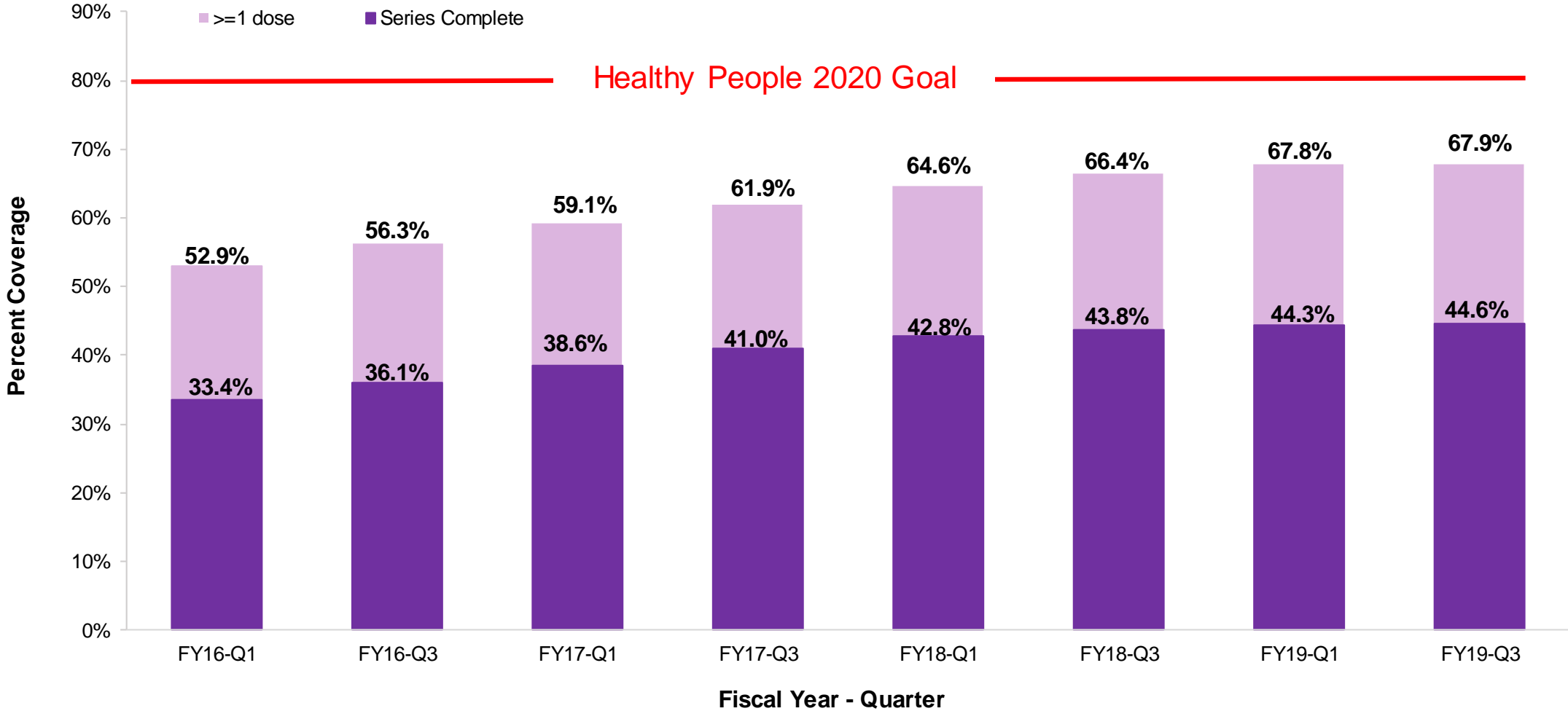


Source: NYC DOHMH Citywide Immunization Registry (numerators) and NYC DOHMH Epiquery and 2010 US Census (population estimates).

<sup>1</sup> ACIP has recommended routine HPV vaccination for females ages 9-26 since 2006 and for males ages 11-21 since 2011.

<sup>2</sup> Series can be completed with 2 or 3 doses depending on series initiation at <15 years of age and interval between dose 1 and dose 2 is >5 months

# HPV Vaccine Coverage Among 13 Year-Olds by the 13<sup>th</sup> Birthday



Source: NYC DOHMH Citywide Immunization Registry (numerators) and NYC DOHMH Epiquery and 2010 US Census (population estimates).





# HPV Vaccination Coverage

Percent of adolescents ages 13-17 who completed the human papillomavirus (HPV) vaccine series






Highest		Percent
1	Jackson Heights	91.4
2	Mott Haevn	90.9
3	University/Morris Heights	89.4
4	Hunts Point	88.3
5	Sunset Park	87.7

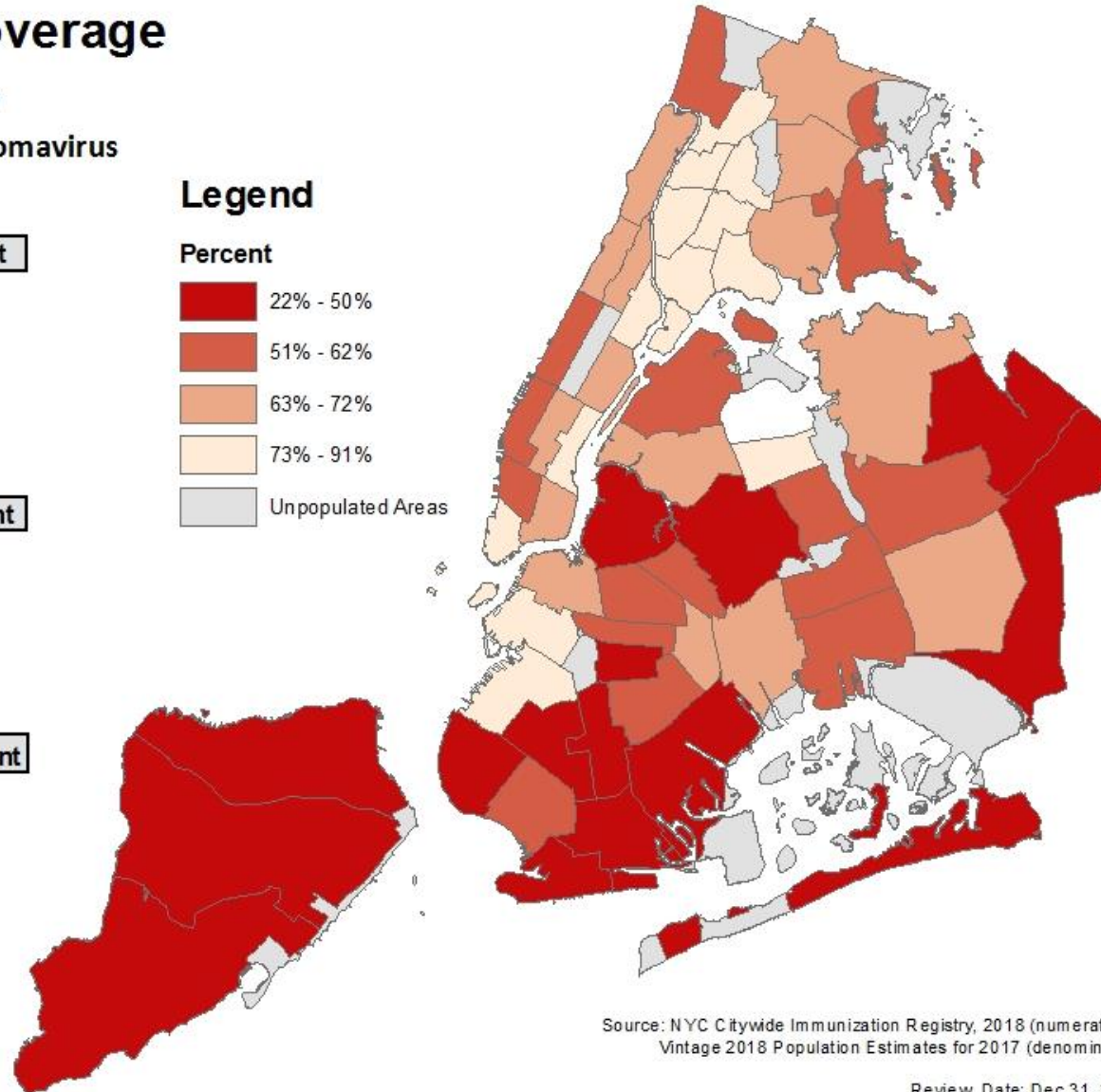
Lowest		Percent
59	Tottenville and Great Kills	22.2
58	Williamsburg and Greenpoint	22.7
57	Borough Park	29.2
56	Willowbrook and South Beach	30.2
55	Sheepshead Bay	33.3

Borough		Percent
	Manhattan	69.0
	Bronx	77.4
	Brooklyn	50.4
	Queens	61.2
	Staten Island	35.5

**NYC Overall: 67.7%**

## Legend

Percent	
	22% - 50%
	51% - 62%
	63% - 72%
	73% - 91%
	Unpopulated Areas



Source: NYC Citywide Immunization Registry, 2018 (numerator);  
Vintage 2018 Population Estimates for 2017 (denominator)

Review Date: Dec 31, 2018  
Created Date: March 12, 2019

# Lessons Learned

- Identify population and communities at risk
  - Immunization Information Systems
  - Geography, religion or ethnicity
- Establish relationships before an outbreak
  - Providers
  - Community organizations providing services
  - Community leaders
  - Haredi health department community liaison
- Cultural sensitivity

# Ongoing DOHMH HPV Work

- Quality improvement visits (IQIP)
- Provider feedback reports
  - Twice annually
  - Recognition
- Provider and public education
  - Updating HPV toolkit
  - Grand rounds

# DOHMH Plans

- Target HPV education to providers in the Orthodox Jewish community
- HPV materials being developed for the Orthodox Jewish community
  - Address vaccine myths
- Targeted efforts in Staten Island
- Expanded work with SBHCs and schools
- Development adolescent facing materials

# Q & A

For more information:

<https://www1.nyc.gov/site/doh/providers/health-topics/measles.page>

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347-396-2471

Thank you!

# Extra Slides

# Strategies for Vaccine Use

- Eradication
  - Complete absence of transmission and no risk of disease
  - Gold standard is smallpox
- Elimination
  - Interruption of transmission in a geographically defined area
- Control
  - Focus is reduction of transmission and disease prevention

# Examples of Definitions for Elimination

- Measles
  - No endemic transmission for  $\geq 1$  year
  - Quality of surveillance
  - Vaccine coverage and population immunity
  - Importations may occur
- Tetanus
  - *C. tetani* spores are present in the soil worldwide
  - Focus is on maternal and neonatal tetanus
  - $< 1$  case neonatal tetanus per 1,000 live births per district