INFLUENZA IN 2020-2021

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INFLUENZA IN 2020-2021

- No disclosures

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INFLUENZA IN 2020-2021

- Overview
- Prevention
- Diagnostics
- Treatment

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INFLUENZA

- Orthomyxovirus: 3 types (A,B,C)
- Influenza A subtypes classified by 2 surface antigens: HA, NA
- Antigenic drift
  - Minor change in A subtype or B virus
  - Occurs continually
- Antigenic shift
  - Major change influenza A subtype; new HA alone or with a new NA

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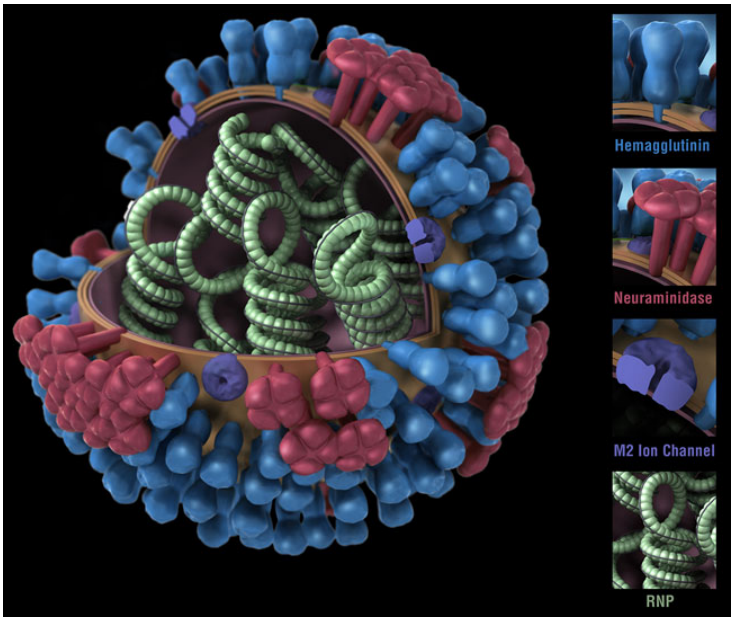

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INFLUENZA

- Annual circulation in US late fall- early spring
- Spread by droplet
- Typically sudden onset of fever, malaise, headache, myalgia followed by respiratory symptoms
- Young infants may have fever alone or sepsis like
- Most children recover within a wk but healthy as well as high risk children may have severe disease or complication (myocarditis, myositis, encephalitis)
- Children < 2yrs have hosp. rates similar to >65yrs
- May have secondary bacterial infection
  - Staph aureus, Strep pyogenes, Pneumococcus

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INFLUENZA

2019-2020 US

188 pediatric flu deaths

- 81 children< 5 yrs of age
  - 12 < 6 months
- 107 children 5-17 yrs of age

- 2/3 of deaths were due to flu B
- Historically up to 80% of pediatric influenza-associated deaths occur in unvaccinated children >6 months of age

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QUESTION FOR 2020-2021

- What kind of influenza season will there be?
- What is going to happen to COVID 19?
- Will there be a “twindemic”?
- What about other seasonal viruses such as respiratory syncytial virus, parainfluenza, rhinovirus, other coronaviruses?

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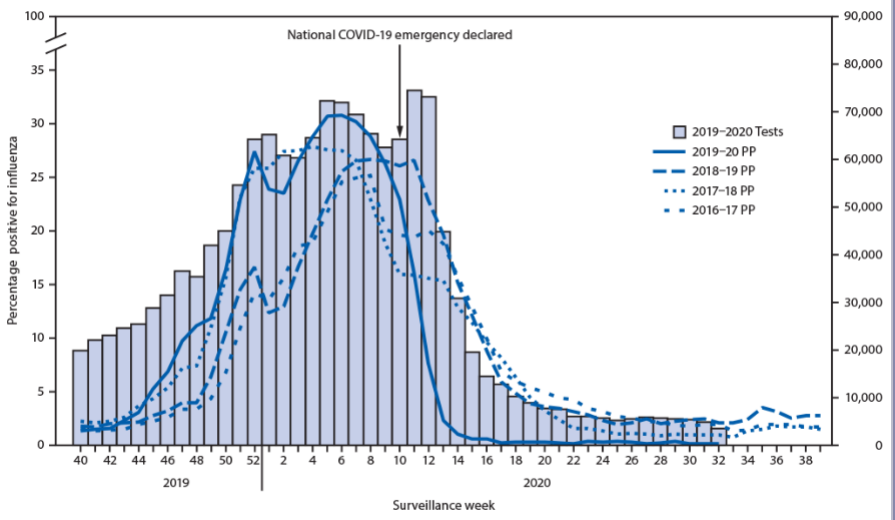
FIGURE 1. Number of respiratory specimens tested and percentage testing positive for influenza, by year — United States, 2016–17 through 2019–20 seasons



Source: FluView Interactive. https://www.cdc.gov/flu/weekly/fluviewinteractive.htm.

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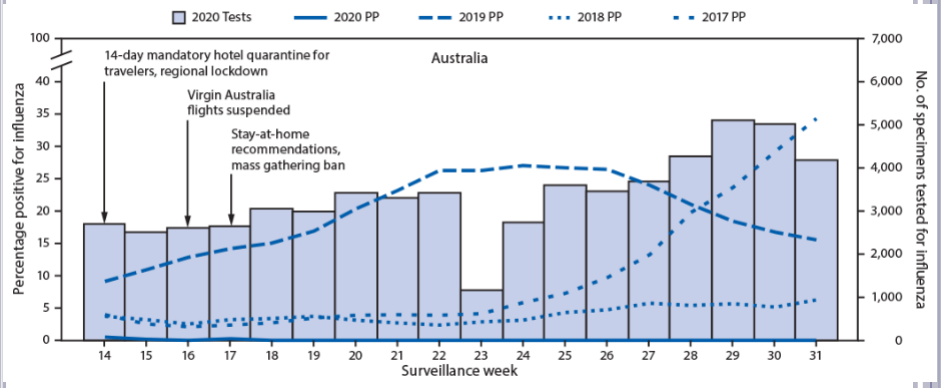

Suggested citation for this article: Olsen SJ, Azziz-Baumgartner E, Budd AP, et al. Decreased Influenza Activity During the COVID-19 Pandemic — United States, Australia, Chile, and South Africa, 2020. MMWR Morb Mort Wkly Rep 2020;69:1305–1309. DOI: http://dx.doi.org/10.15585/mmwr.mm6937a6 .

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INFLUENZA: PREVENTION

- Nonpharmaceutical Interventions
  - Stay home when sick
  - Wash hands
  - Cover coughs/sneezes
  - Avoid touching the face
  - Keep surfaces clean
  - Masks
  - Distancing
  - Small cohorts
- Immunization
- Chemoprophylaxis in selected cases

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INFLUENZA VACCINES

- Most inactivated influenza vaccine (IIV) grown in hen's eggs
- Since 1977, 3 components IIV3
  - Recent H1N1,H3N2, influenza B
- Since 1980 2 types of influenza B circulating so IIV4 developed

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Influenza Vaccines

Many different products

- Most children will receive quadrivalent inactivated influenza vaccine (IIV4) intramuscular
- Live attenuated influenza vaccine, quadrivalent (LAIV4) intranasal 2-49yrs
- Adults >65 high dose quadrivalent inactivated influenza vaccine (HD-IIV4) intramuscular
- 2 vaccines not made with eggs, given im
  - Cell culture based quadrivalent (CCIIV4) ≥4 yrs of age
  - Recombinant quadrivalent (RIV4) ≥18 yrs of age

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Influenza Vaccines: Contraindications and Precautions

- Contraindication
  - History of severe allergic reaction to vaccine
- Precautions
  - History of Guillan-Barre within 6wks of flu vaccine
  - Moderate or severe acute illness with or without fever
- Additional Contraindications for Live attenuated vaccine
  - Concurrent salicylate therapy
  - Children 2-4 with asthma or wheezing in prior year
  - Immunosuppressed
  - Close contact of severely immunosuppressed
  - Pregnancy
  - CSF leak or cochlear implant
  - Recent antifluenza drug
- Additional Precautions for Live attenuate vaccine
  - Asthma in children ≥ 5 yrs of age
  - Children at high risk for complications

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INFLUENZA EGG BASED VACCINES: 2020-21

- A/Guangdong-Maonan/SWL1536/2019 (H1N1) pdm09-like virus
- A/Hong Kong/2671/2019(H3N2)-like virus
- B/Washington/02/2019(Victoria lineage)-like virus
- B/Phuket/3073/2013(Yamagata lineage)-like virus

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INFLUENZA CELL CULTURE-BASED INACTIVATED (CCIIV4) AND RECOMBINANT (RIV4) VACCINES 2020-2021

- A/Hawaii/70/2019(H1N1) pdm09-like virus
- A/Hong Kong/45/2019(H3N2)-like virus
- B/Washington/02/2019(Victoria lineage)-like virus
- B/Phuket/3073/2013(Yamagata lineage)-like virus

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INFLUENZA VACCINES

- Start at 6 months of age
- 2 doses for children 6m-8y receiving for first time
  - At least 1 month apart
- Annual vaccine
- Encourage family members, especially in pregnancy; contacts of infants<6m and immunosuppressed
- Encourage health care workers

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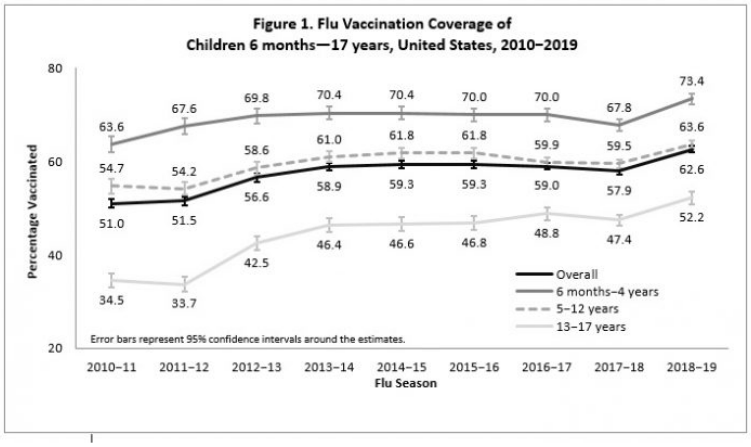

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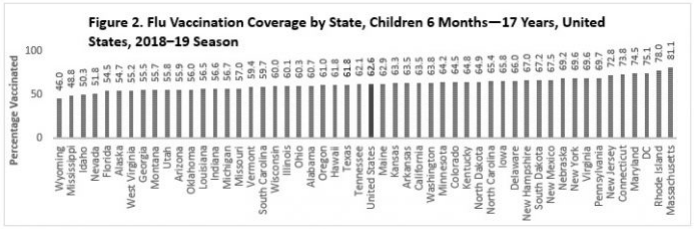

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Parental Hesitancy About Routine Childhood and Influenza Vaccinations: A National Survey

Methods

- Feb, 2019 Online survey across US of families with children 6m to <18 yrs
- Used a modified Vaccine Hesitancy Scale

Results

- 2176/4445 parents responded (49%)

Kempe A, Saville AW, Albertin C et al. Pediatrics 2020; 146 (1):e20193852

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Parental Hesitancy About Routine Childhood and Influenza Vaccinations: A National Survey

Routine Vaccines	Influenza
Hesitancy	
6.1%	25.8%
Perceived efficacy	
70%	26%

Concerns for side effects:
- 12% had strong concerns
- 27% had some concerns

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Rethinking Flu Vaccine Messaging

- Educate our families about burden of flu disease, morbidity (sick visits, hospitalizations) as well as mortality
- Rebrand flu as a routine immunization
- Provide reassurance of vaccine safety
- Discuss efficacy in preventing severe illness rather than focusing on match of the vaccine with circulating strains

De St Maurien A and Edwards K. Pediatrics 2020;146(1):e 20201770

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Effects of Influenza Vaccination in the United States During the 2017-2018 Influenza Season

Methods:

- National age specific estimates of vaccine coverage and disease burden for 2017-2018
- Estimated vaccine efficacy with PCR confirmed flu in ambulatory setting looking at vaccine status
- Compartmental model with age stratification to estimate effect of vaccine on disease burden

Results:

- Overall vaccine efficacy of 38%
- Estimated that vaccine prevented 7.1 million illnesses, 3.7 million medical visits, 109,000 hospitalizations, 8000 deaths
- Decrease in hospitalization for young children 6m-4yrs was calculated at 41%

Rolfes MA, Flannery B, Chung JR et al. Clin Infect Dis 2019; 69(11):1845-1853

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Expand Access to Flu Immunization

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Testing for Influenza

Indications:

- Hospitalized children with possible influenza
- Other children where it will affect management (ie use of antimicrobials, other testing)

Best to test early in course of illness if considering antiviral therapy

Know the characteristics of the test being performed

Follow when flu is in the community

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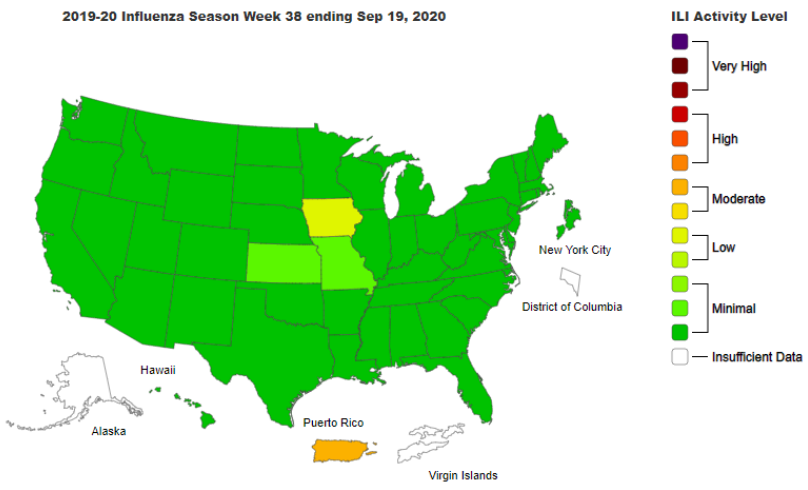

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TESTING FOR INFLUENZA

Test	Utility
Molecular • Rapid • RT PCR • Multiplex PCR	High sensitivity/specificity
Antigen assays	Limited sensitivity/high spec; not for hospitalized pts
Viral culture • Shell • Conventional	Ability to test for multiple viruses and can do further testing on isolate
Serology	Surveillance/Research

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INFLUENZA:TREATMENT

Who should be treated?

- Any hospitalized child with influenza, even if symptoms for > 48 hrs
- Children with flu at risk for serious complications
  - Children < 5yrs, especially <2 yrs
  - Children with certain underlying medical conditions or on long term aspirin therapy
- Consider for contacts of children <6m or high risk
- Most effective if started within 48hrs

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INFLUENZA:TREATMENT

Neuraminidase inhibitors

- Oseltamivir
  - Oral, any age, 5days; mainly GI side effects
- Zanamivir
  - Inhaled, ≥ 7yr, 5 days; not for use if respiratory disease because may cause bronchospasm
- Peramivir
  - IV; ≥ 2yr and; ill for ≤ 2 days, single dose

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INFLUENZA:TREATMENT

Inhibitor of influenza cap dependent endonuclease

- Baloxavir
  - Oral, ≥12 yr, single dose
  - Associated with mutations and decreased susceptibility
  - Avoid giving with dairy products, beverages with calcium, antacids, cation containing laxatives, supplements

M2 inhibitors

- Amantadine, Rimantidine
  - Not currently recommended because of resistance

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Chemoprophylaxis for Influenza

Oseltamivir and zanamivir are the drugs used

- High risk child unable to be vaccinated
- Unimmunized contacts(family,HCP) of unimmunized children at HR:<2yrs
- Outbreak control for unimmunized in facility with HR children
- In addition to vaccine if HR and may not respond to vaccine
- For HR/contacts if vaccine not good match

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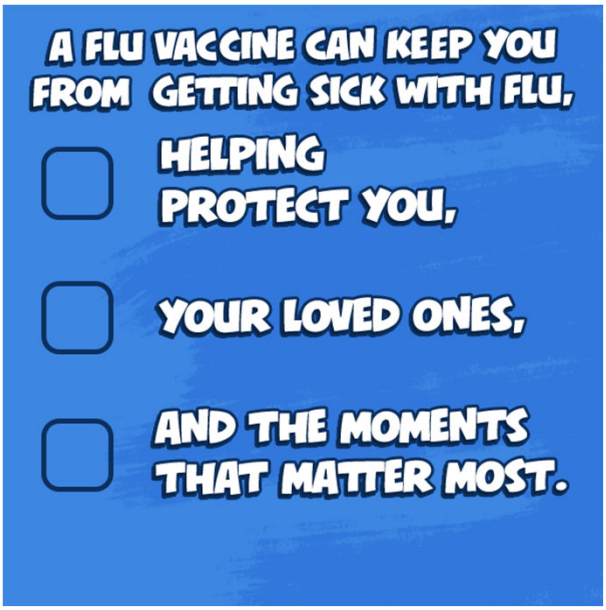

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