UT Health San Antonio

AETC AIDS Education & Training Center Program South Central

Influenza in People with HIV

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Conflict of Interest Disclosure Statement

- I am a part of an independent research project funded by Gilead Sciences on HIV and Hepatitis B.

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Use of Trade/Brand Names

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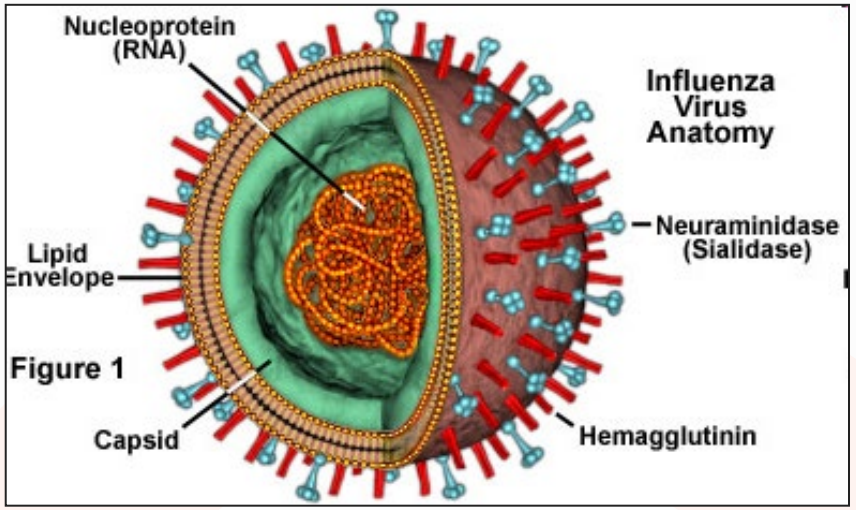
Learning Objectives

1. Recognize that people with HIV (PWH) may be at higher risk of complications from influenza.
2. Recognize the common symptoms caused by influenza.
3. Identify strategies to reduce the risk of influenza in people with HIV (PWH).

Influenza Virus

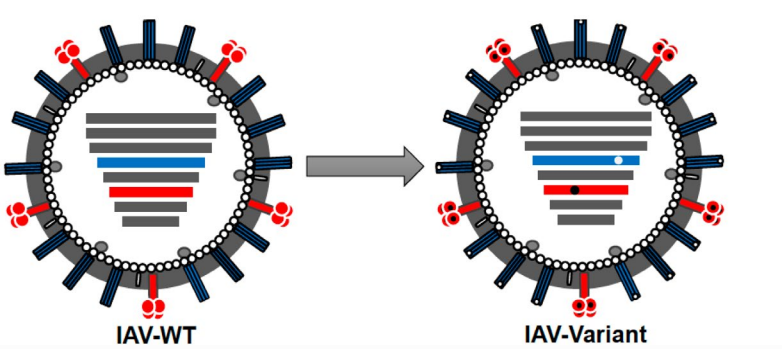
- Surrounding the helical nucleocapsids is a lipid envelope with two viral glycoproteins:
  - **hemagglutinin** (H)
  - **neuraminidase** (N)
- Antibody to H is correlated with protection against disease
- Strains are identified by the specific H and N antigen combination (e.g., H3N1)



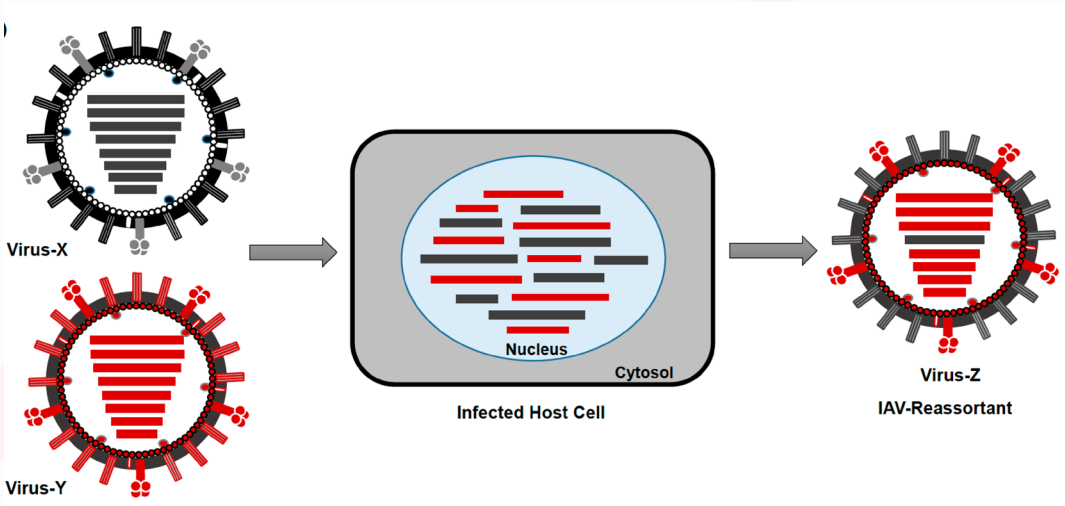
Influenza Virus

- Virus polymerase is error prone due to lack of proofreading activities
- Segments assemble at random into virions, some of which are infectious
- Influenza infections may be endemic, epidemic or pandemic

Antigenic Drift

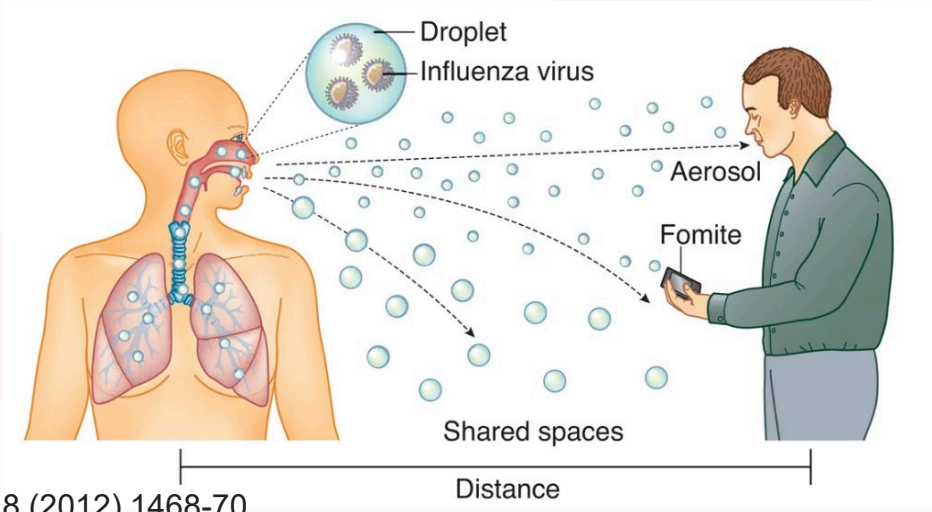


Antigenic Shift



Influenza transmission

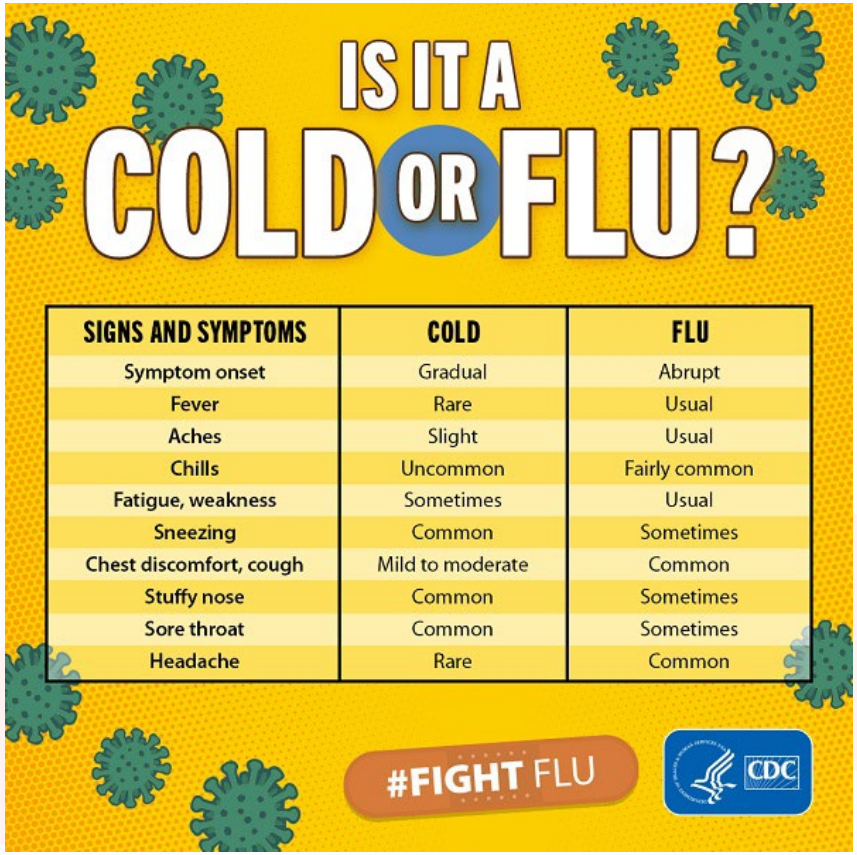
- Respiratory virus:
  Transmission by aerosol droplets or direct contact
- Inhalation of as few as 3 infective particles can transmit infection
- Young children are the most likely to be infected & to spread infection
- When influenza A is introduced into a family, up to 60% of exposed persons eventually get infected with at least half getting clinical syndrome



Lakdawala S. *Nature Medicine.* 18 (2012) 1468-70.

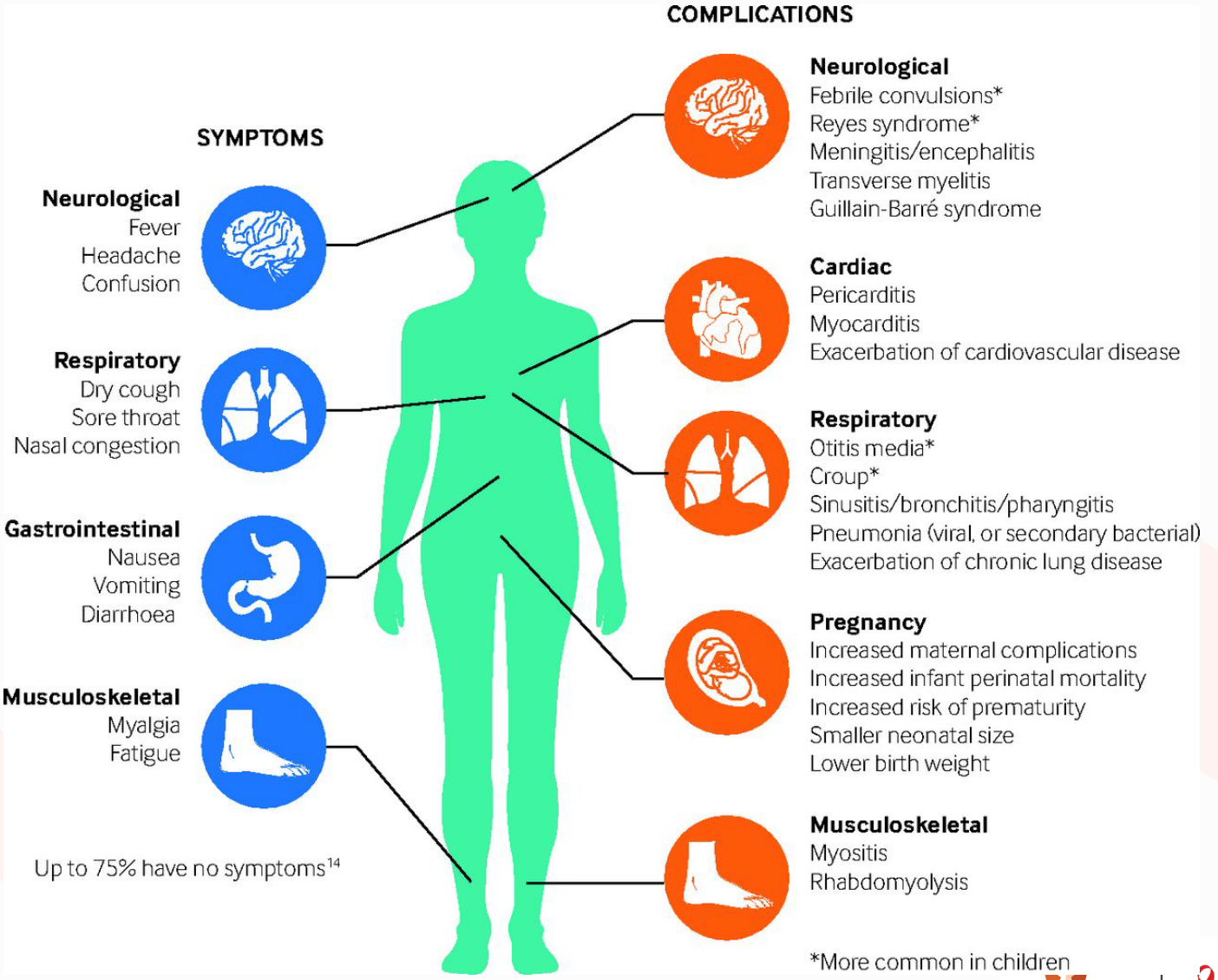
Influenza Syndrome

- T≥100.4F, feeling feverish, chills
- Fatigue
- Myalgias (body aches)
- Headaches
- Runny nose, nasal congestion
- Sore throat
- Nonproductive cough
- Shortness of breath



SIGNS AND SYMPTOMS	COLD	FLU
Symptom onset	Gradual	Abrupt
Fever	Rare	Usual
Aches	Slight	Usual
Chills	Uncommon	Fairly common
Fatigue, weakness	Sometimes	Usual
Sneezing	Common	Sometimes
Chest discomfort, cough	Mild to moderate	Common
Stuffy nose	Common	Sometimes
Sore throat	Common	Sometimes
Headache	Rare	Common

Symptoms & Complications of Influenza



PWH are at high risk of serious influenza-related complications

- PWH, especially those with low CD4 or those not on ART
- During flu season, PWH are at increased risk for heart- & lung-related hospitalizations
- PWH may have prolonged flu symptoms, higher risk of flu-related complications, & prolonged influenza virus shedding
- Other conditions associated with developing serious complications from flu include asthma, heart disease, & diabetes

Influenza Testing in 2022-2023

- Patients with acute respiratory illness symptoms with or without a fever
- A patient can have both influenza & COVID-19
- Order respiratory specimens for influenza and SARS-CoV-2 testing
  - Multiplex nucleic acid detection assay for influenza A/B/SARS-CoV-2
  - Influenza nucleic acid detection assay PLU SARS-CoV-2 nucleic acid detection if multiplex testing not available

Types of testing

- Antigen
  - Rapid assays (10-15 min)
    - Two EUA for Flu A/B and SARS-CoV-2
  - DFA staining (2-4 hours)
- Nucleic acid detection (molecular assays)
  - Rapid molecular assays (15-30 min)
  - Other
    - Single-plex PCR
    - Multi-plex PCR can include other pathogens including SARS-CoV-2
  - Higher sensitivity and specificity

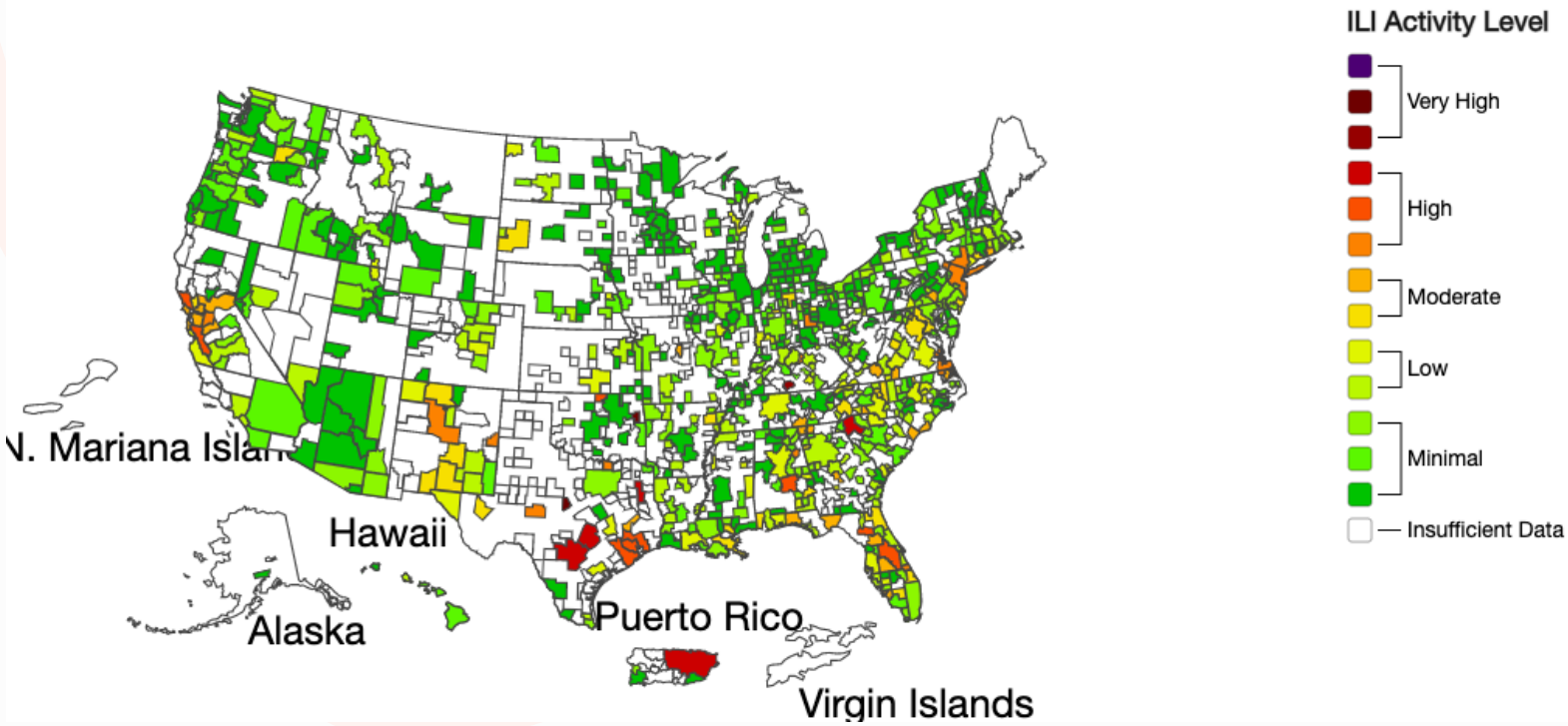
FLUVIEW interactive

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Outpatient Respiratory Illness Activity Map Determined by Data Reported to ILINet

This system monitors visits for respiratory illness that includes fever plus a cough or sore throat, also referred to as ILI, not laboratory confirmed influenza and may capture patient visits due to other respiratory pathogens that cause similar symptoms.

2022-23 Influenza Season Week 4 ending Jan 28, 2023



https://www.cdc.gov/flu/weekly/index.htm

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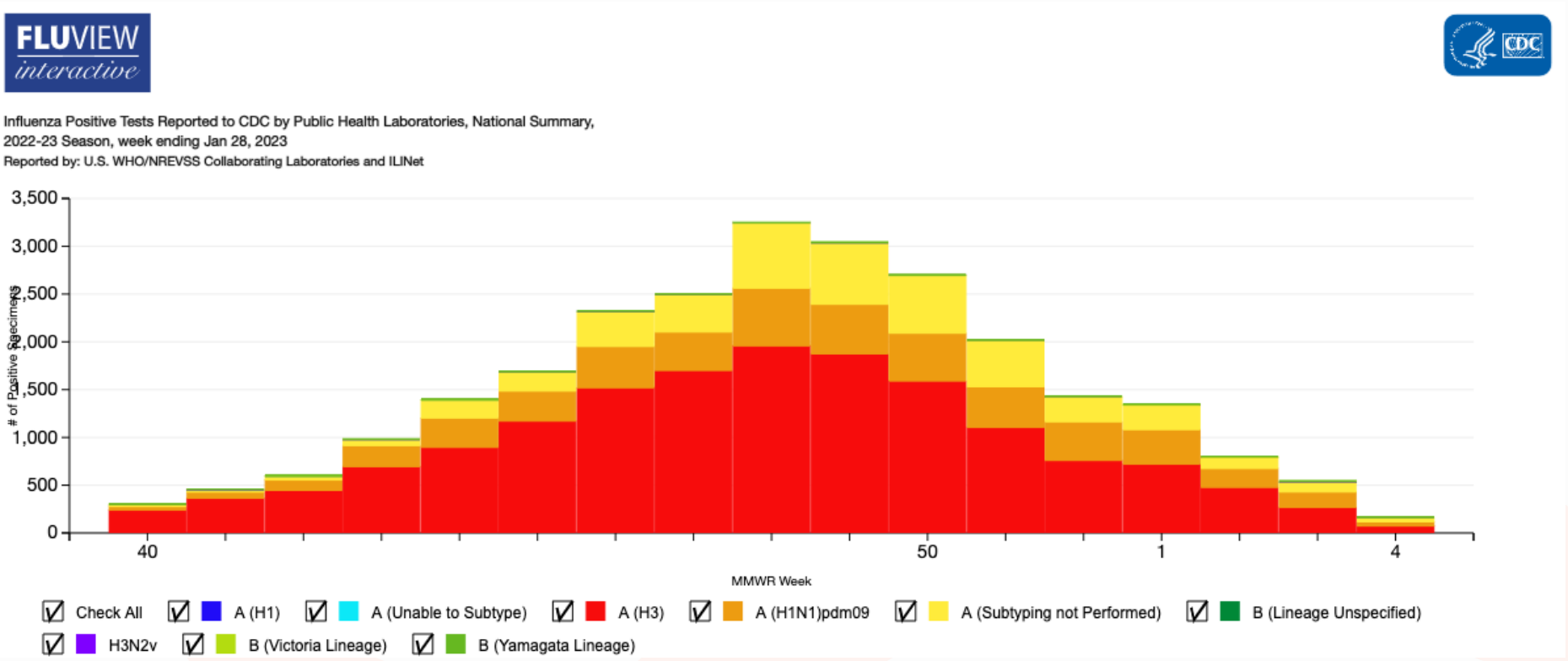
Flu season 2022-2023 so far…



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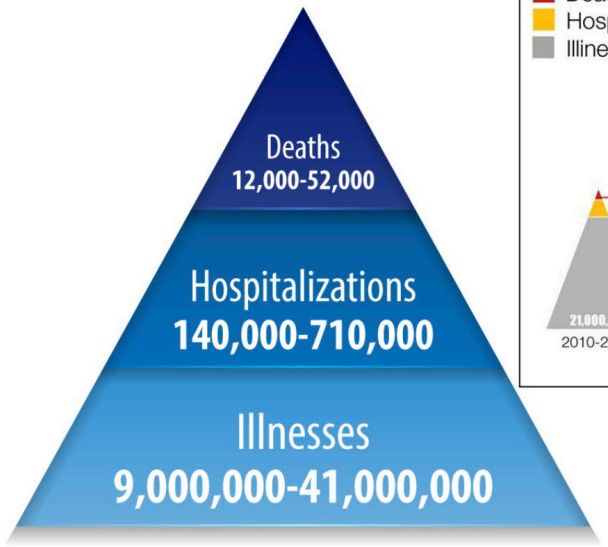
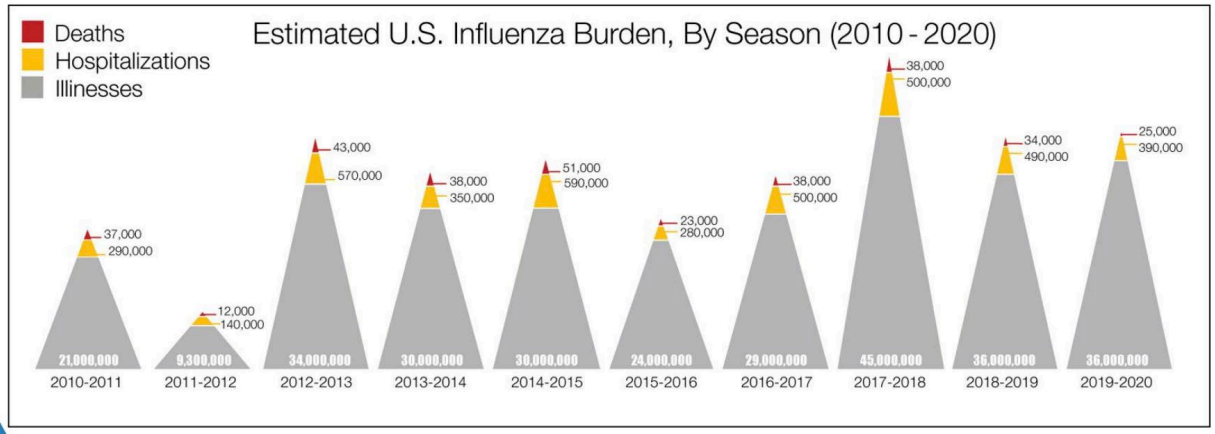
Testing is the tip of the iceberg





- **Seasonal influenza epidemics vary in severity**

2021-2022 (preliminary estimates):

* 9 million illnesses
* 4 million medical visits
* 100,000 hospitalizations
* 5,000 deaths

https://www.cdc.gov/flu/about/burden/index.html

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Influenza Treatment

- Close monitoring and early initiation of antiviral treatment if fever and/or respiratory symptoms develop
- Neuramindase inhibitors (prevent virus from leaving cell)
  - Duration: 5 days, longer if hospitalized with pneumonia or ARDS
    - Oseltamivir po 75mg po bid (CrCl >60 mL/min)
    - Inhaled Zanamivir
  - Peramivir IV 600mg IV once (CrCl ≥50 mL/min)
- Polymerase acidic endonuclease inhibitor (prevents viral replication)
  - Baloxavir po once (not recommended for those with immunocompromise)

Influenza Treatment

- Prescribe empiric antiviral treatment as soon as possible based on a clinical diagnosis of influenza in those with progressive disease of any duration
- For healthy non-high-risk persons with illness >2 days, unlikely benefit to antiviral treatment
- Supportive care: rest, hydration, NSAIDS/acetaminophen
- Consider bacterial coinfection in those who do not improve in 3-5 days

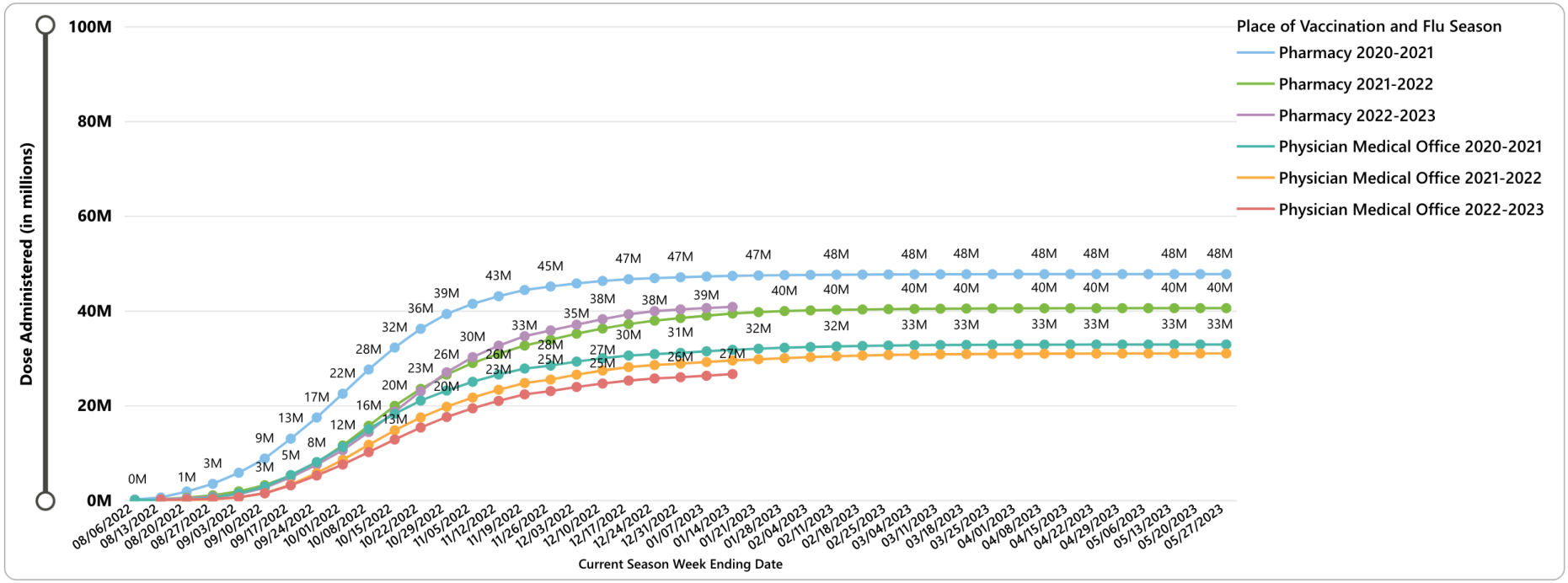
Influenza vaccine recommendations

- Annual flu vaccine recommended for all persons ≥6 months without contraindications
- All 2022-23 flu vaccines are quadrivalent
  - A (H3N2), A(H1N1)pdm09, B/Victoria, B/Yamagata
- ACIP recommends higher dose and adjuvanted vaccines for those ≥65 years old on 6/22/2022
  - High dose is 4x antigen concentration, adjuvanted, or recombinant (3x antigen concentration)
  - If not available, use standard dose

Seasonal Flu Vaccination Recommended for all PWH

- Studies have shown that an adult PWH who receive flu vaccination have reduced risk of influenza illness and reduced need for provider visits
- Flu vaccine effectiveness is not 100% so education about influenza-related symptoms and early flu treatment is important, especially for those with low CD4 or not receiving ART

Estimated number of vaccines administered, 2020-2023



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Antiviral prophylaxis

- Neuraminidase inhibitor antiviral medications are 70-90% effective in preventing influenza against susceptible influenza viruses so can be useful adjuncts to flu vaccine
- Chemoprophylaxis may be considered in those at high risk for complications after exposure to a person with influenza…
  - During first 2 weeks following vaccination after exposure
  - For those who cannot receive influenza vaccine due to contraindication
  - Those with severe immune deficiency who might not respond to influenza vaccine

Antiviral prophylaxis

- Taken daily for the duration of potential exposure to person with influenza and continue for 7 days after last known exposure
- Start within 48 hours of exposure
- Oseltamivir
  - 75mg po qday (CrCl >60mL/min)
  - 30mg po qday (CrCl 30-60 mL/min)
  - Further dose reduction in renal impairment, dialysis

Resources

- National Clinician Consultation Center http://nccc.ucsf.edu/
  - HIV Management
  - Perinatal HIV
  - HIV PrEP
  - HIV PEP line
  - HCV Management
  - Substance Use Management
- AETC National HIV Curriculum https://aidsetc.org/nhc
- AETC National Coordinating Resource Center https://targethiv.org/library/aetc-national-coordinating-resource-center-0

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