



Influenza 2021 and Beyond

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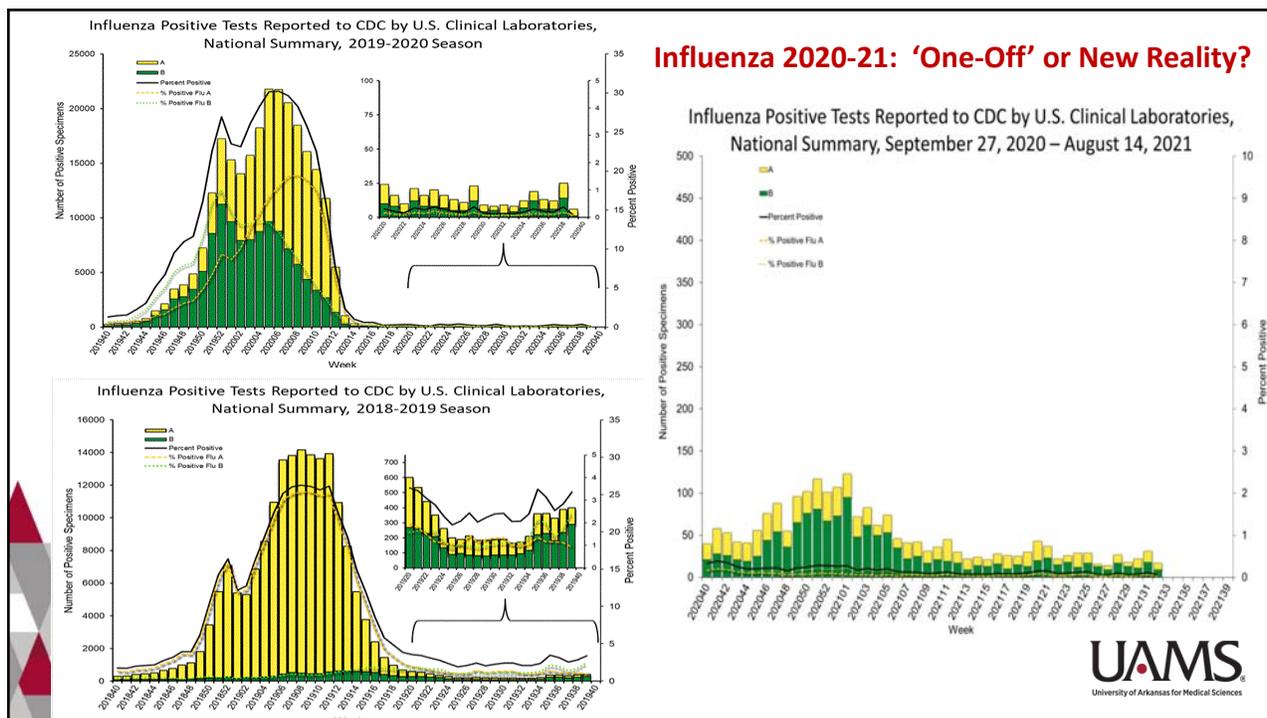
Outline

- Influenza Historical Perspective
- Other common viral pathogens
- Impact of Influenza and Vaccines
- Strain Changes
- Projections for Influenza 2021 and beyond
- Immunization Communication, Messaging

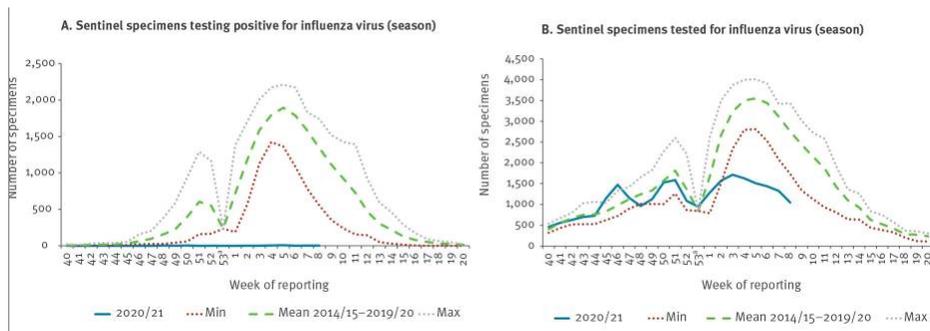


2020-2021 was NOT Normal

- COVID-19 consumed much of our public health energy and messaging
- COVID-19 disease devoured much of our medical work and resources
- Our public health measures worked- as expected
 - Best when employed swiftly and consistently
 - Affected the trajectory of COVID-19 in communities
 - Had significant impacts on other respiratory infections
- The strains on our healthcare systems are showing...



EU: Influenza *Nearly* Non-Existent in 2020-21



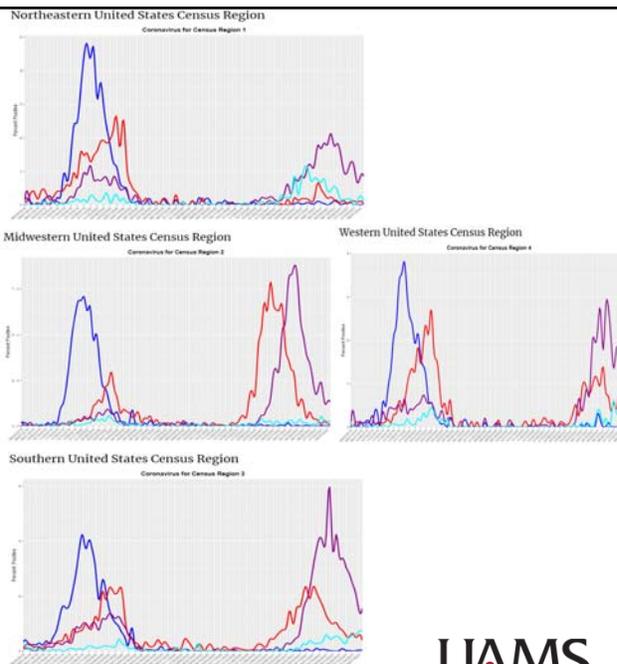
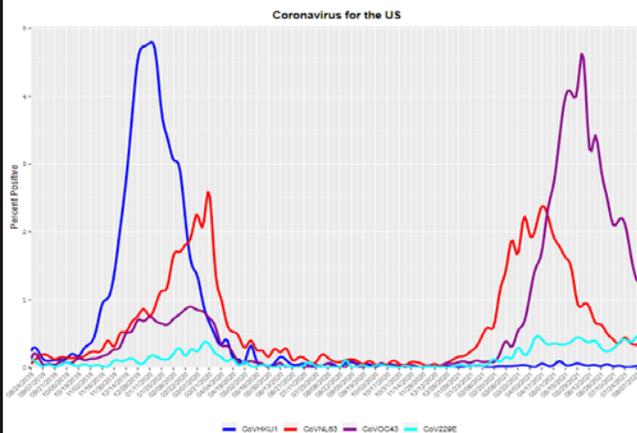
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7976381/>



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USUAL Coronaviruses: NON-COVID

Coronavirus



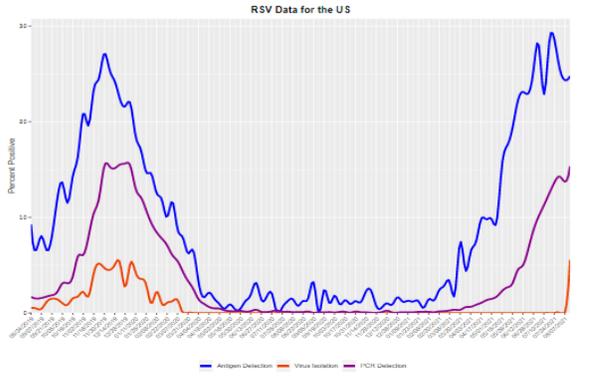
<https://www.cdc.gov/surveillance/nrevss/coronavirus/region.html>



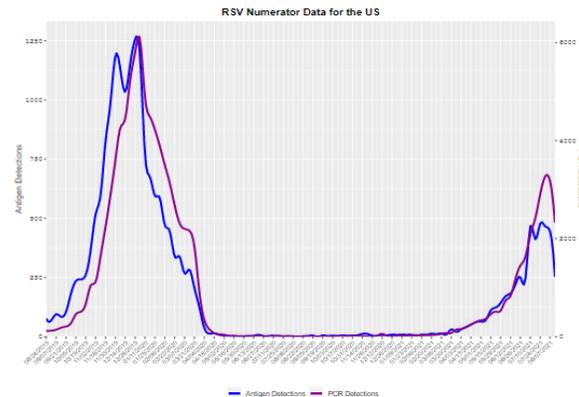
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Respiratory Syncytial Virus (RSV)

Percent Positive



Detections



<https://www.cdc.gov/surveillance/nrevss/rsv/natl-trend.html>



Snapshot Messages

2021 was NOT 'normal':

Epidemiology of many viral diseases *far different* from most years

Why?

What we DO know:

Reduced travel

'Shut downs'

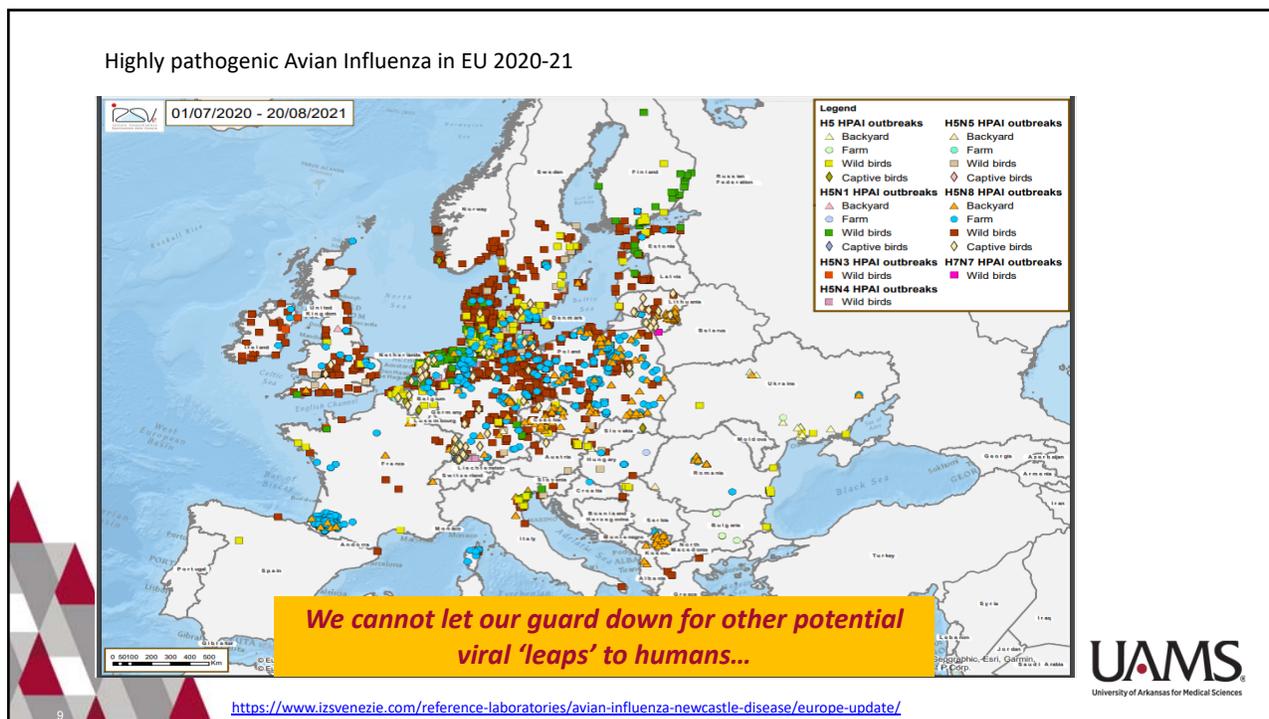
Mask use

Greater focus on public health measures: hand washing, social distancing

What we DO NOT know:

There may certainly be other factors which we do not (yet) understand...





Influenza Disease Across the Lifespan

Influenza causes	MILLIONS* of illnesses	35.5 M
	MILLIONS* of medical visits	16.5 M
	HUNDREDS of THOUSANDS* hospitalizations	490,600
	TENS of THOUSANDS* of deaths annually	34,200
	HUNDREDS* of lab confirmed pediatric deaths	136

2018-19

- Persons 65 and older have highest rate of hospitalization and death
- Chronic medical conditions, ethnicity, pregnancy (+2 wk. postpartum), obesity increase risk for complications
- Most infections, healthcare visits in children- most children hospitalized= healthy prior

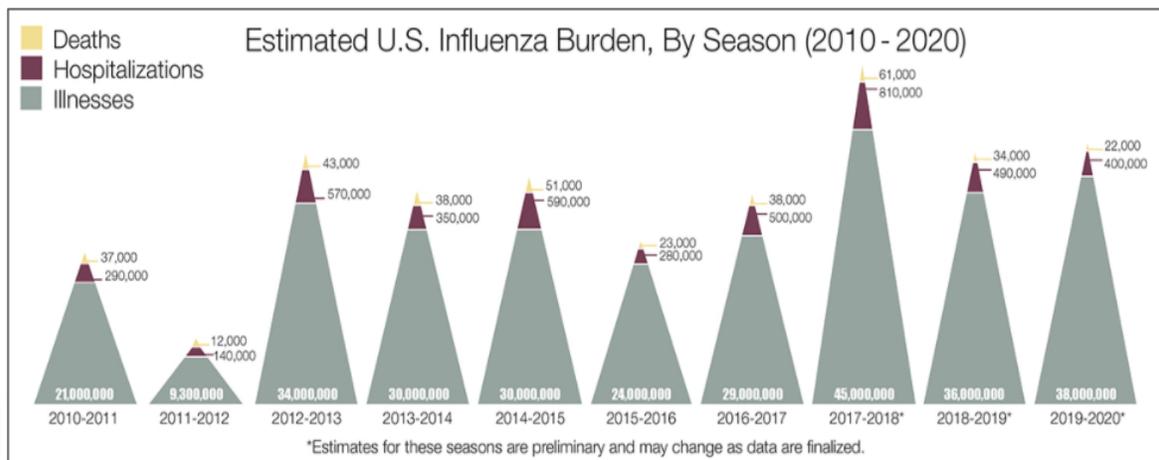
Individuals at high risk for Influenza complications likely outnumber those not at high risk in most Internal Medicine and Family Practices...

<https://www.cdc.gov/flu/about/burden/2018-2019.html>

*2020-21 was an exception

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Figure 2: Estimated U.S. Influenza Burden, By Season



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

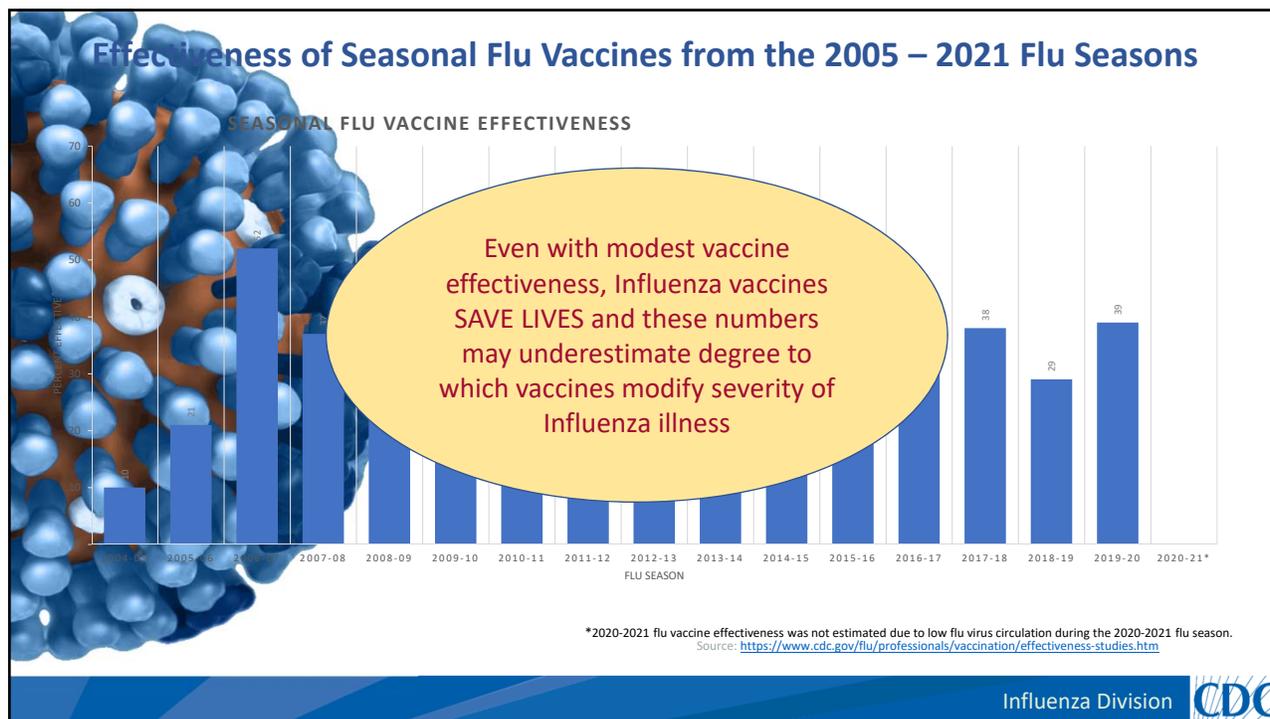
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Influenza is NOT the Same Year/Year

- '(Especially single strand RNA) **Viruses are chameleons**'
 - As long as virus is replicating, there is an opportunity for new strains to emerge
 - Some changes lead to mismatch between strains selected for vaccines and what is circulating
 - This can result in lower vaccine efficacy against a particular strain
 - At times, the strains chosen for the vaccine will not match with what actually circulates
- **DRIFT** [small changes in virus which result in changes in virus surface] frequently occurs
 - Generally immune system will recognize a drifted virus in the same family
- **SHIFT** [major change in virus, can result in a new surface NA, HA proteins] uncommon
 - Can occur when an animal influenza virus develops ability to infect humans
 - May be so different human immune system does not recognize the virus [no immunity]
 - This can lead to a pandemic, as when Influenza A(H1N1)pdm09 emerged

<https://www.cdc.gov/flu/about/viruses/change.htm>

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Influenza Strain Changes: Background

WHO biannual meetings Feb [NH], September [SH] to select Vaccine strains

Pandemic initially reduced Influenza surveillance, many countries- did improve

Low levels of influenza detections, fewer viruses available for characterization

Overall 55% worldwide was Influenza B (most B Victoria >> B Yamagata),

Influenza A(H3N2) and A(H1N1)pdm09 were detected, more in September-November 2020

Globally Sept 20-Feb 21, most circulating Influenza from tropics, subtropics, few temperate N Hemisphere

Overall 0.2% testing positivity vs usual 17%

EU, N America: 20% reduction in testing, 99% reduction in positives...

Majority + were Influenza B. Influenza A detected were A(H1N1)pdm09, A(H3N2)

Asia: reduced activity from usual, Influenza A and B strains detected

S. Arabia, Afghanistan, Iran, China: majority B

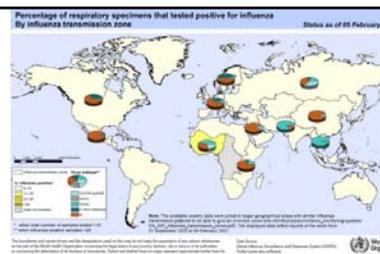
S. Korea only Influenza A, A(H1N1)pdm09 predominant over A(H3N2)

Japan slight increase in activity week 5, 2021, A(H3N2)

Subtropical, Tropical: generally very low activity, cocirculation Influenza B, A(H1N1)pdm09 and A(H3N2)

Majority Influenza B followed by A(H3N2) and few outbreaks A(H1N1)pdm09

Temperate S Hemisphere: much lower than usual interseason disease, only 11 positive samples.



https://www.who.int/influenza/vaccines/virus/recommendations/202102_recommendation.pdf

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Influenza Strains and Changes

• 2020-21 Vaccine Season

Egg-Based

- A/Guangdong-Maonan/SWL1536/2019 (H1N1) pdm09-like virus
- A/HongKong/2671/2019 (H3N2)-like virus
- B/Washington/02/2019-like virus (B/Victoria line.)
- B/Phuket/3073/2013-like virus (B/Yamagata line.)

Recombinant/Cell-Culture

- A/Hawaii/70/2019 (H1N1) pdm09-like virus
- A/HongKong/45/2019 (H3N2)-like virus
- B/Washington/02/2019-like virus (B/Victoria line.)
- B/Phuket/3073/2013-like virus (B/Yamagata line.)

• 2021-22 Vaccine Season

Egg-Based

- A/Victoria/2570/2019 (H1N1) pdm09-like virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019-like virus (B/Victoria line.)
- B/Phuket/3073/2013-like virus (B/Yamagata line.)

Recombinant/Cell Culture

- A/Wisconsin/588/2019 (H1N1) pdm09-like virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019-like virus (B/Victoria line.)
- B/Phuket/3073/2013-like virus (B/Yamagata line.)

<https://www.fda.gov/vaccines-blood-biologics/lot-release/influenza-vaccine-2020-2021-season>
<https://www.fda.gov/vaccines-blood-biologics/lot-release/influenza-vaccine-2021-2022-season>

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Influenza Vaccines 2021-22

- All US Vaccines will be quadrivalent
- Many lots released by FDA
- Pharmacies, Hospitals, Clinics, Community Immunizers receiving
- Vaccine programs starting
- Challenges:
 - Getting people through the door
 - Vaccine choice
 - Coadministration
 - Minimizing strain on already stretched Healthcare teams

Manufacturer	Total Number of Lots Released by FDA
Afluria Quadrivalent Seqirus Pty, Ltd.	44
Fluad Quadrivalent Seqirus, Inc.	17
Fluarix Quadrivalent GlaxoSmithKline Biologicals	35
Flublok Quadrivalent Protein Sciences Corporation	13
Flucelvax Quadrivalent Seqirus, Inc.	28
FluLaval Quadrivalent ID Biomedical Corporation of Quebec	34
FluMist Quadrivalent Medimmune, LLC	4
Fluzone High Dose Quadrivalent Sanofi Pasteur, Inc	16
Fluzone Quadrivalent Sanofi Pasteur, Inc.	30

<https://www.fda.gov/vaccines-blood-biologics/lot-release/influenza-vaccine-2021-2022-season>

accessed 9/8/2021, site updated 9/2/2021

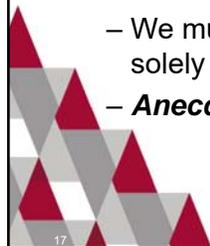
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Projections for Influenza 2021-22 and beyond...

With relaxing of public health measures and increase in travel, I expect:

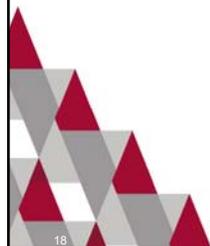
- Dramatic increase in influenza activity over 2020-21 and potentially a historic (BAD) year
- Communications challenges: COVID-19, Influenza are both our enemies
- Challenges with Influenza-COVID-19 Coinfection
 - Early case identification
 - Diagnosis
 - Rapid treatment
- Potentially more severe disease, hospitalization, ICU/mechanical ventilation, . . .
 - We must not forget that many (most??) deaths in 1918 Influenza pandemic were not solely due to Influenza...
 - **Anecdotally**, many are seeing more ARB in hospitals since COVID pandemic began



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Longer term projections

- New vaccination technologies
 - Needle-free vaccines
- New vaccines
 - mRNA vaccines in evaluation are 1 example



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Immunization Communications, Messaging

In the office/clinic/hospital

- Entire team needs to be 'on the same page' re: Influenza vaccination
- Consistent message:

Influenza is major cause of severe disease, vaccination is important and Dr. Hopkins recommends it for YOU TODAY to reduce your risk and give you the same protection that we, the team, employ.

- For patients who have concerns or questions
 - [Mutually] respectful 'ask' what questions or concerns do you have?
 - Do not debate myths- can state which are incorrect but best to pivot to risk of disease
 - Acknowledge patient motivations
 - Be transparent about what we do and do not know.
 - If patient decides to delay: document and followup as planned to close the deal



Immunization Communications, Messaging

In public communications [Media, Community Groups, etc.]

- Influenza is NOT just a minor respiratory virus, most years millions ill, thousands die.
 - Influenza causes serious disease, can worsen chronic medical issues and lead to hospitalization, prolonged disability, and even death
 - Risk is greatest in our youngest (<5), oldest (>65), certain ethnic groups, and in our persons with obesity and chronic diseases.
 - WE have a tool which helps prevent disease and can reduce risk for these bad outcomes *which none of us want to see*: VACCINATION
 - Vaccines are recommended for *everyone 6 months of age and older*
 - Vaccines are safe -cannot cause influenza- and are particularly critical in our COVID pandemic
 - **Get your Influenza vaccination today!**
- Do it for yourself, for your family and for your community.**



Questions?

