COVID-19, Influenza and the Coming Months: A Primer for Preparation of Older Adults and their Caregivers

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17 September 2020
Disclosures

- Research Support
  - AiCuris, Genentech/Roche, Gilead, Janssen, Shire

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  - AlloVir, Celltrion, Genentech/Roche, Janssen, Shionogi, Viracor Eurofins, VirBio

- Unpaid Consultation
  - GlaxoSmithKline, Romark, Vertex

- Data & Safety Monitoring Board Participation
  - Janssen, Merck, SAB Biotherapeutics, Sequiris, Takeda, Vitaeris
  - Chair DMID/NIAID Adaptive COVID-19 Trial

As of 9/12/20; ° Paid to Northwestern University.
COVID-19 Update for 2020

• Epidemiology
• Prevention
  o Masking and social distancing
  o Vaccines
• Treatment Options
• What to Expect from the Flu Season
COVID-19: Current Global Situation

Daily deaths of patients diagnosed with coronavirus (7-day rolling average)

- Latin America now accounts for 41 per cent of average global deaths
- US share of average global daily deaths has fallen to 14 per cent

Total excess deaths per million people

- Ecuador (July 01)
- Spain (June 21)
- Peru (July 08)
- UK (to June 26)
- Italy (April 30)
- Belgium (June 07)
- Netherlands (June 17)
- Sweden (June 23)
- Chile (July 08)
- US (June 13)
- Portugal (July 07)
- France (June 28)
- Switzerland (June 28)
- Brazil (June 19)
- Austria (June 28)
- Germany (June 07)
- Denmark (May 13)
- Norway (June 14)
- Iceland (May 03)
- S Africa (June 30)

https://www.ft.com/content/a26fbf7e-48f8-11ea-aeb3-955839e06441 - Accessed 12 September 2020
COVID-19: Current Situation in the United States

COVID-19: Illinois Situation

Race: Death

Race: Diagnosis

COVID-19: Special Populations - Minorities

Coronavirus cases per 10,000 people, by age and race

<table>
<thead>
<tr>
<th>Age</th>
<th>All</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>23</td>
<td>62</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>10 - 19</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 - 29</td>
<td></td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>30 - 39</td>
<td></td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>40 - 49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 - 79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80+</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control and Prevention | Note: Data is through May 28.

COVID-19: Illinois Situation

Diagnosis by Age

Death by Age

COVID-19: Epidemiology – Co-Morbidity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Proportion</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>0.1607</td>
<td>4638</td>
</tr>
<tr>
<td>Chronic cardiac disease</td>
<td>0.1804</td>
<td>97764</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>0.09735</td>
<td>69764</td>
</tr>
<tr>
<td>Chronic pulmonary disease</td>
<td>0.09710</td>
<td>97764</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0.06175</td>
<td>441</td>
</tr>
<tr>
<td>Dementia</td>
<td>0.08875</td>
<td>8634</td>
</tr>
<tr>
<td>Asthma</td>
<td>0.07476</td>
<td>7445</td>
</tr>
<tr>
<td>Chronic neurological disorder</td>
<td>0.06985</td>
<td>7445</td>
</tr>
<tr>
<td>Obesity</td>
<td>0.06432</td>
<td>5790</td>
</tr>
<tr>
<td>Rheumatologic disorder</td>
<td>0.05935</td>
<td>5236</td>
</tr>
<tr>
<td>Malignant neoplasm</td>
<td>0.05935</td>
<td>5236</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.03045</td>
<td>6491</td>
</tr>
<tr>
<td>Chronic hemolytic disease</td>
<td>0.02484</td>
<td>5320</td>
</tr>
<tr>
<td>Liver disease</td>
<td>0.01995</td>
<td>2434</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>0.01452</td>
<td>5016</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>0.00422</td>
<td>4340</td>
</tr>
<tr>
<td>AIDS/HIV</td>
<td>0.00238</td>
<td>6998</td>
</tr>
</tbody>
</table>

COVID-19: Special Populations - Obesity

[Graph showing the proportion of patients experiencing events by age group and obesity class.]


COVID-19: Symptoms

Symptoms can range from mild to severe illness, and appear 2-14 days after you are exposed to the virus that causes COVID-19.

Seek medical care immediately if someone has emergency warning signs of COVID-19.

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face
Long-Term Complications of COVID-19

Pain that lingers
A subset of COVID-19 patients experience ongoing symptoms and complications such as organ damage, and researchers are proposing reasons for some of them (bottom). Scientists are trying to identify such symptoms, how common they are, how long they last, who’s at risk, and how to treat and prevent them.

Taste and Smell

1 Brain fog
Difficulty thinking can occur after acute COVID-19 infection. The virus may damage brain cells, and inflammation in the brain or body may also cause neurologic complications. Other viral infections can also lead to brain fog.

2 Shortness of breath
Doctors are eyeing lung and heart complications including scarring. Patients who become critically ill with COVID-19 seem more likely to have lingering shortness of breath, but those with mild cases are also at risk.

3 Heart arrhythmia
The virus can harm the heart, and doctors are concerned about long-term damage. How the heart heals after COVID-19 could help determine whether a patient develops an irregular heartbeat.

4 Hypertension
Some patients have high blood pressure after an acute infection, even when cases were relatively mild and people were previously healthy, possibly because the virus targets blood vessels and heart cells.
Prevention Strategies

https://blogs.sciencemag.org/vis/2020/08/14/covid-a-visual-library/ Accessed 12 Sept 2020
# COVID-19: Transmission and Masks

<table>
<thead>
<tr>
<th>Chance of Transmission</th>
<th>Asymptomatic COVID-19 Carrier</th>
<th>Uninfected Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGHEST</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>HIGH</td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>MEDIUM</td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>LOW</td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>LOWEST</td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td>PRACTICALLY NONE</td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
</tbody>
</table>

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Northwestern Medicine®
COVID-19: Transmission and Masks

- It only works if you wear it.
- It only works if you wear it.
- It only works if you wear it.
- It only works if you wear it.

Northwestern Medicine
Social Distancing: How the US Did Compared to Other Countries

Change in Retail and Recreation Visits

Change in Grocery and Pharmacy Visits

COVID-19 Risk and Usual Activity

COVID-19: Prevention - Vaccines

CanSino: AdV Vector
Gamaleya: AdV Vector
SinoVac: CornaVac, protein

“These are the Top Coronavirus Vaccines to Watch.” *Washington Post*. 2 September 2020.
COVID-19: RNA/DNA and Viral Vaccines

Nucleic acid vaccines, developed by...

- Moderna; National Institutes of Health
  - PC P1 P2 P3 A
- Pfizer; BioNTech; Fosun Pharma
  - PC P1 P2 P3 A
- ArGenx; Osaka University; Takara Bio
  - PC P1 P2 P3 A
- China’s Academy of Military Sciences; Wolvax Biotech
  - PC P1 P2 P3 A
- CureVac
  - PC P1 P2 P3 A
- Genexine
  - PC P1 P2 P3 A
- Imperial College London; VacEquity Global Health
  - PC P1 P2 P3 A

Viral-vector vaccines, developed by...

- AstraZeneca; University of Oxford
  - PC P1 P2 P3 A
- CanSino Biologics; Beijing Institute of Biotechnology
  - PC P1 P2 P3 A
- Gamaleya Research Institute*
  - PC P1 P2 P3 A
- Janssen Pharmaceutical
  - PC P1 P2 P3 A

“These are the Top Coronavirus Vaccines to Watch.” *Washington Post.* 2 September 2020.
COVID-19: Protein Vaccines

These are the Top Coronavirus Vaccines to Watch. Washington Post. 2 September 2020.
Want to Help? Join a Study of SARS-CoV-2/COVID-19 Vaccine!

- Current COVID-19 Vaccine Trials
  - Multiple Centers in Chicago Participating
  - Priority given to high risk populations
    - Older adults
    - Minorities
    - Essential employees
  - Sign Up Online
    - https://www.coronaviruspreventionnetwork.org

Help find a vaccine for COVID-19!

We're looking for:
- Adults aged 18 and older
- People who are more likely to be exposed to COVID-19, including:
  - People with underlying medical conditions
  - People with greater chances of exposure at their job
  - People who live or work in elder-care facilities
  - People over age 65
  - People who work in jails or prisons
  - People from racial and ethnic groups that have been impacted in greater numbers by the epidemic, such as African Americans, Latinx, and Native Americans

If you are interested in being contacted about COVID-19 vaccine and other prevention studies, please register in the online Northwestern COVID Prevention Trials Registry

https://is.gd/NUVaccineStudy
You can also reach us via email at NUVaccineStudy@northwestern.edu or by calling 312-695-5012.
COVID-19: *Time to Vaccination*

**Phase 1**
- **Phase 1a “Jumpstart Phase”**:  
  - High-risk workers in health care facilities  
  - First responders  
- **Phase 1b**:  
  - People of all ages with comorbid and underlying conditions that put them at significantly higher risk  
  - Older adults living in congregate or overcrowded settings

**Phase 2**  
- Critical risk workers—workers who are both in industries essential to the functioning of society and at substantially high risk of exposure  
- Teachers and school staff  
- People of all ages with comorbid and underlying conditions that put them at moderately higher risk  
- All older adults not included in Phase 1  
- People in homeless shelters or group homes for individuals with physical or mental disabilities or in recovery  
- People in prisons, jails, detention centers, and similar facilities, and staff who work in such settings

**Phase 3**  
- Young adults  
- Children  
- Workers in industries essential to the functioning of society and at increased risk of exposure not included in Phase 1 or 2

**Phase 4**  
- Everyone residing in the United States who did not receive the vaccine in previous phases

**Equity is a crosscutting consideration:** In each population group, vaccine access should be prioritized for geographic areas identified through CDC’s Social Vulnerability Index.

National Academies of Sciences, Engineering, and Medicine.
COVID-19: *Time to Vaccination*

Advisory Committee on Immunization Practices
COVID-19: Management Options

COVID-19: What Does the Future Hold?
Influenza: What We Normally See

Estimated U.S. Influenza Burden, By Season (2010 - 2019)

- Deaths
- Hospitalizations
- Illnesses

*Estimates for these seasons are preliminary and may change as data are finalized.
Seasonal Influenza: *Mortality and Hospitalizations*

**Mortality**
- P & I Deaths
- Resp & Circ Deaths
- All-Cause Deaths

**Hospitalizations**
- Healthy
- High risk

## Influenza: Risk Groups

### Table 1. Risk Factors for Complications of or Severe Illness with 2009 H1N1 Virus Infection.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Examples and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt;5 yr</td>
<td>Increased risk especially for children &lt;2 yr of age; highest hospitalization rates among children &lt;1 yr</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Risk of hospitalization increased by a factor of 4 to 7, as compared with age-matched nonpregnant women, with highest risk in third trimester</td>
</tr>
<tr>
<td>Chronic cardiovascular condition</td>
<td>Congestive heart failure or atherosclerotic disease; hypertension not shown to be an independent risk factor</td>
</tr>
<tr>
<td>Chronic lung disorder</td>
<td>Asthma or COPD, cystic fibrosis</td>
</tr>
<tr>
<td>Metabolic disorder</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Neurologic condition</td>
<td>Neuromuscular, neurocognitive, or seizure disorder</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>Associated with HIV infection, organ transplantation, receipt of chemotherapy or corticosteroids, or malnutrition</td>
</tr>
<tr>
<td>Morbid obesity†</td>
<td>Suggested but not yet proved to be an independent risk factor for complications requiring hospitalization or ICU admission and possibly for death</td>
</tr>
<tr>
<td>Hemoglobinopathy</td>
<td>Sickle cell anemia</td>
</tr>
<tr>
<td>Chronic renal disease</td>
<td>Renal dialysis or transplantation</td>
</tr>
<tr>
<td>Chronic hepatic disease</td>
<td>Cirrhosis</td>
</tr>
<tr>
<td>Long history of smoking</td>
<td>Suggested but not yet proved to be an independent risk factor</td>
</tr>
<tr>
<td>Long-term aspirin therapy in children</td>
<td>Risk of Reye’s syndrome; drugs containing salicylates should be avoided in children with influenza</td>
</tr>
<tr>
<td>Age ≥65 yr</td>
<td>Highest case fatality rate but lowest rate of infection</td>
</tr>
</tbody>
</table>

* COPD denotes chronic obstructive pulmonary disease, HIV human immunodeficiency virus, and ICU intensive care unit.
† Morbid obesity is defined as a body-mass index (the weight in kilograms divided by the square of the height in meters) of 40 or more.
What We Know from the Southern Hemisphere

[Graphs showing flu season comparison between 2020 and 2015-19 for Paraguay, South Africa, Argentina, Australia, Chile, and New Zealand.]

*As reported to WHO’s Global Influenza Surveillance and Response System.

Vaccine Benefits Beyond Primary Prevention

- Reduced Severity of Illness
  - 2017-2018 Vaccine Impact (38% Overall Vaccine Efficacy):
    - Prevented 7.1 million illnesses, 3.7 million medical visits, 109,000 hospitalizations, and 8000 deaths
    - Prevent 10% of expected hospitalizations

- Reduced Risk of Hospitalization and Death
  - 2013-2014 Vaccine Impact
    - Reduction of in-hospital death: aOR = 0.21 in aged 18-49 years, aOR = 0.48 in 50-64 years, and aOR = 0.39 in ≥65 years
    - Reduced ICU admission: aged 18-49 years (aOR = 0.63) and ≥65 years (aOR = 0.63)
    - Shortened ICU LOS among those 50-64 years (aRH = 1.36) and ≥65 years (aRH = 1.34)
    - Shortened hospital LOS among 50-64 years (aRH = 1.13) and ≥65 years (aRH = 1.24)

- Reduction in Cardiovascular Outcomes in Cardiac Patients

Vaccine Benefits Beyond Primary Prevention

- Reduced Severity of Illness
- Reduced Risk of Hospitalization and Death
- Reduction in Cardiovascular Outcomes in Cardiac Patients
  - Decrease of MI risk (Incidence Risk Ratio (IRR) 0.84, 95%CI: 0.78–0.91)
  - Decrease in all cause mortality in patients with CHF (HR 0.83, 95% CI 0.76-0.91)

Influenza Vaccines: *Knowing Which Vaccine to Get*

- Types of Influenza Vaccine
  - Standard Quadravalent Influenza Vaccine
  - High Dose Quadravalent Influenza Vaccine
  - Adjuvanted Quadravalent Influenza Vaccine
  - Cell Culture Vaccines
  - Recombinant Vaccine
  - Live Attenuated Vaccine
Influenza Vaccine: Composition and Recommendations

• 2020-2021 Influenza Vaccine Composition
  o A/Hawaii/70/2019 (H1N1)pdm09-like virus (updated)
  o A/Hong Kong/45/2019 (H3N2)-like virus (updated)
  o B/Washington/02/2019 (B/Victoria lineage)-like virus (updated)
  o B/Phuket/3073/2013-like (Yamagata lineage) virus

• Current Recommendations for Vaccine
  o All individuals ≥ 6 months of age should be vaccinated
  o September and October are good times to get vaccinated
  o Contraindications: Egg allergy, Guillain-Barre Syndrome due to vaccine
Key Take Home Points

• Get your flu shot (now is the time)
• Where a mask whenever not at home
• Expect a large second wave of disease this winter
• COVID-19 is real
  o Over 6,500,000 cases in the US
  o Over 385,000 (~6%) hospitalizations
  o Over 195,000 deaths (2.3% mortality, >20% if in ICU)
  o Obesity, hypertension and diabetes are key risk factors
Other Things to Consider

• Getting your Flu Shot
• Tips for Mask Use
• Social Isolation and Connecting with Family
  o Thanksgiving and other holidays
  o How to build a safe bubble
  o How to add others to your bubble
• When Can We Travel Again
• Getting Healthcare
• Expect an uptick in cases
• What if someone you know begins to get sick and you saw them recently?
• What can I expect from contact tracing?
• Who to listen to for information?
Questions?
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mgison@northwestern.edu

Forward Chicago: www.forwardchicago.org
Plows Council on Aging: https://www.plows.org
Skyline Village Chicago: http://www.skylinevillagechicago.org
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