

Flu Amid the Pandemic

John A. Sellick, Jr., DO, MS, FACP, FIDSA, FSHEA

Professor of Medicine

Division of Infectious Diseases

Hospital Epidemiologist

KALEIDA Health

Veterans Affairs Western New York Healthcare System



Jacobs School of Medicine
and Biomedical Sciences

University at Buffalo



Kaleida Health



UB|MD

INTERNAL MEDICINE
PRIMARY & SPECIALTY CARE

Disclosure

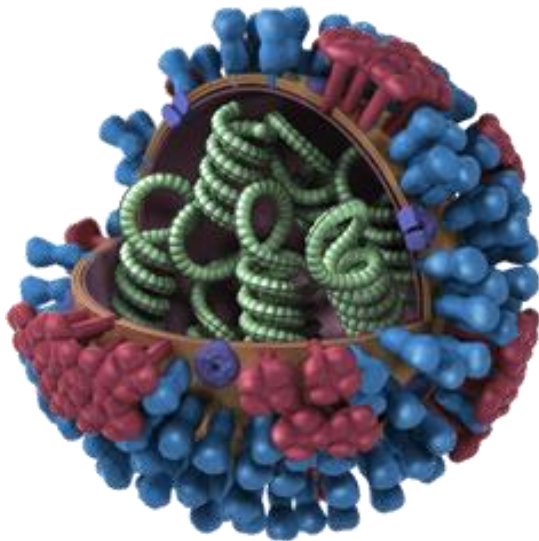
- I have no actual or potential conflict(s) of interest in relation to this presentation.

Influenza Virus

- Another crummy little RNA virus
 - Avian origin
 - Likely human infections for hundreds of years
- 3 types based on RNA:
 - A – humans, animals
 - endemic/epidemic/pandemic
 - B – humans only
 - endemic/epidemic, Ø pandemic, ? less severe
 - C – humans, swine
 - endemic, mild

Influenza Virus

- 8 segmented genome
 - Each segment codes important structural or functional proteins



Hemagglutinin



Neuraminidase



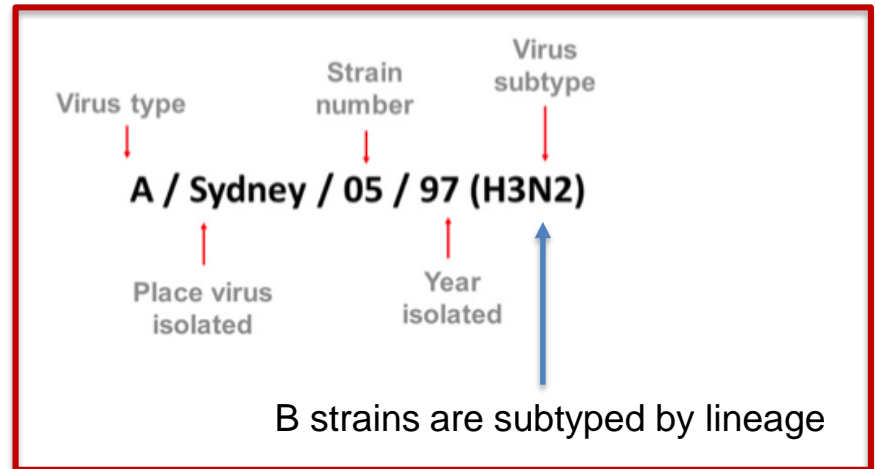
M2 Ion Channel



RNP

HA or H – attachment to cell

NA or N – release of progeny from cell surface

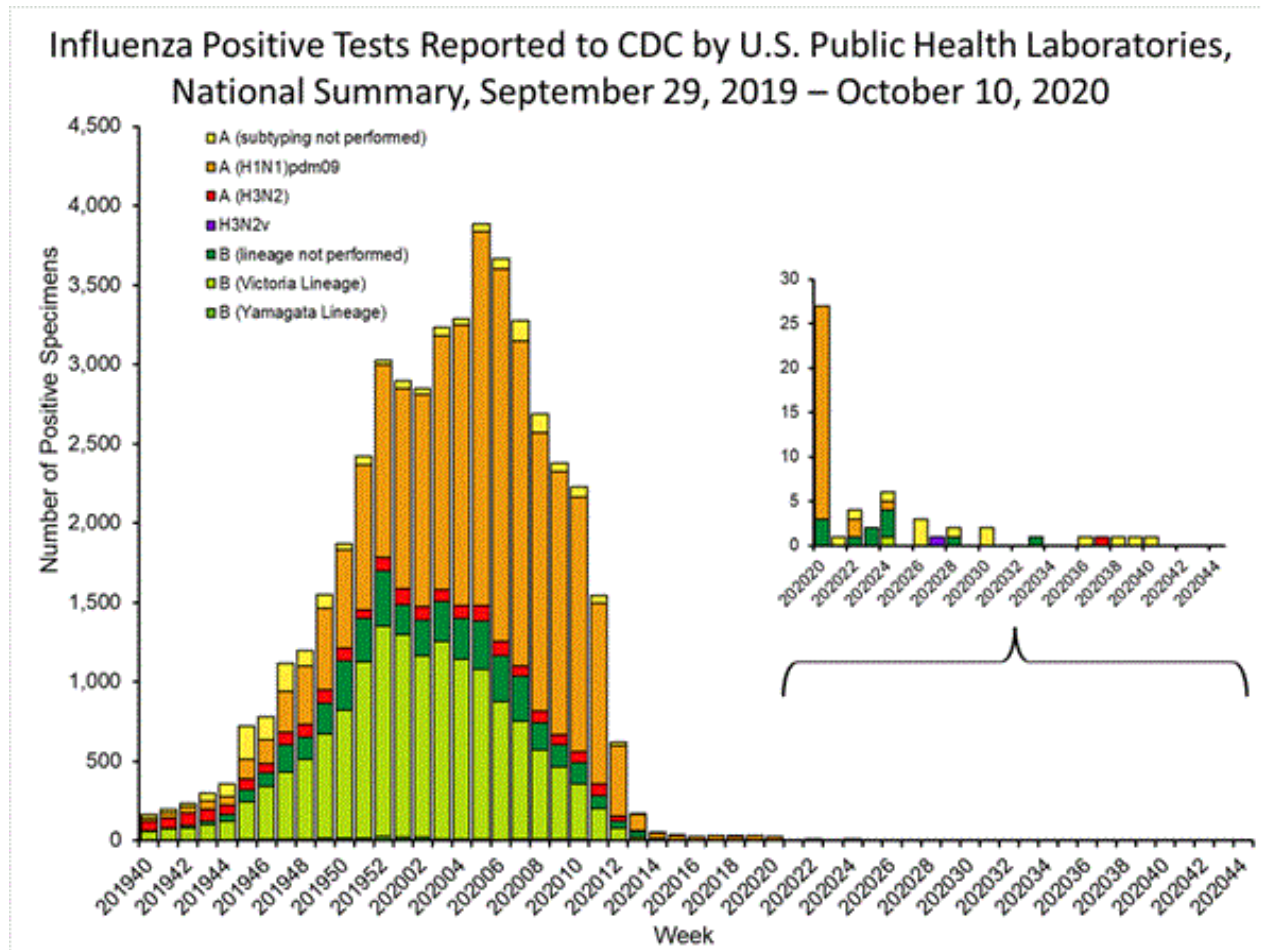


B strains are subtyped by lineage

Influenza A = Unpredictable!

- Seasonality (Nov/Dec – March/April)
 - 1918 & 2009 H1N1 did not get the memo
- Change in HA & NA
 - Gradual mutations – “**drift**” – A (or B)
 - Major re-assortment of genome segments – “**shift**” – A only
- Influenza A pandemics occur when “new” H or H/N types, to which little of the population have antibodies, emerge
- Challenge for vaccinology

What's circulating now?

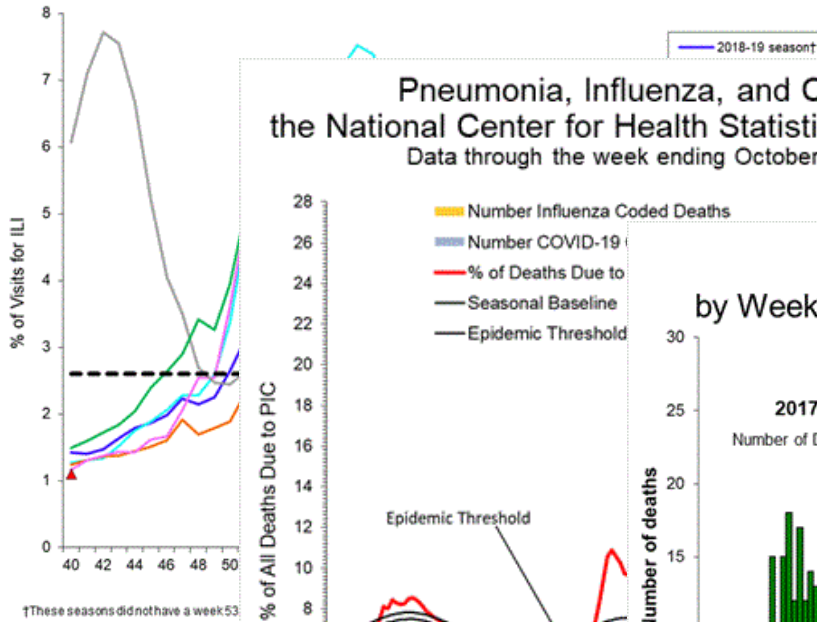


Societal/Medical Importance

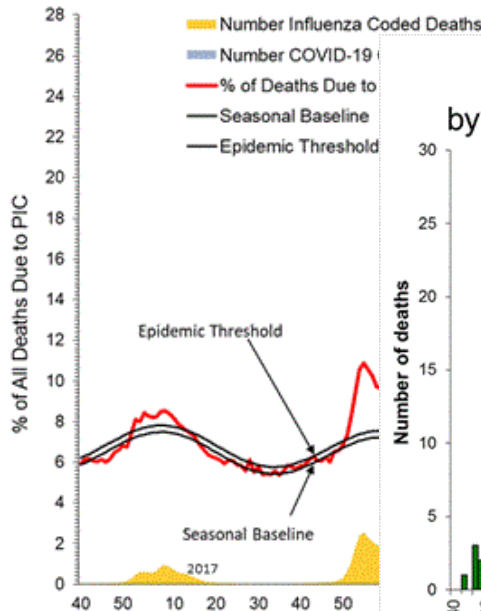
- Absenteeism
 - 3 – 4d in bed
 - 5 – 6d restricted activity
 - 3d lost school/work
- Healthcare utilization
- Morbidity/mortality

By the Numbers

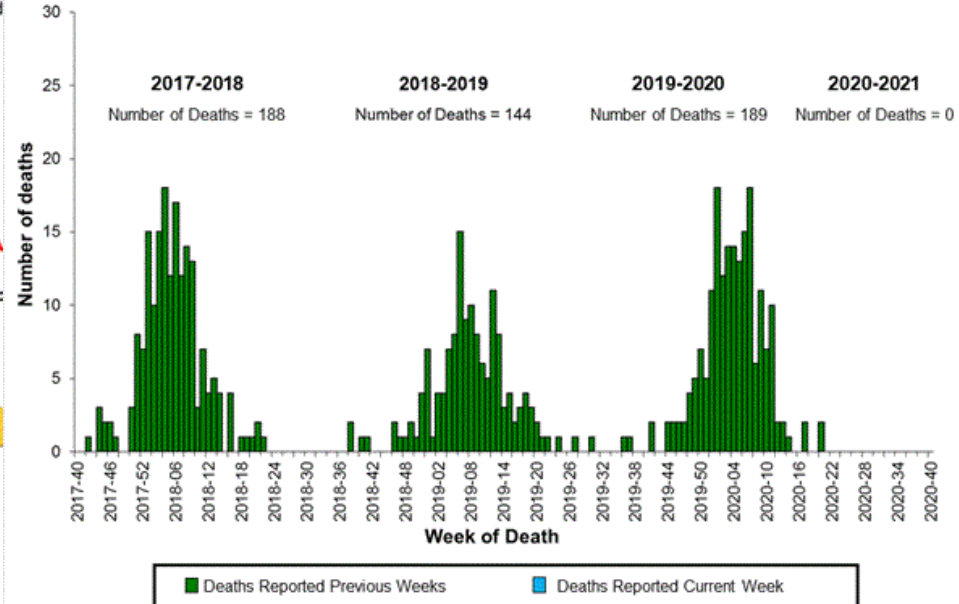
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2020-2021 and Selected Previous Seasons



Pneumonia, Influenza, and COVID-19 Mortality from the National Center for Health Statistics Mortality Surveillance System Data through the week ending October 3, 2020, as of October 8, 2020

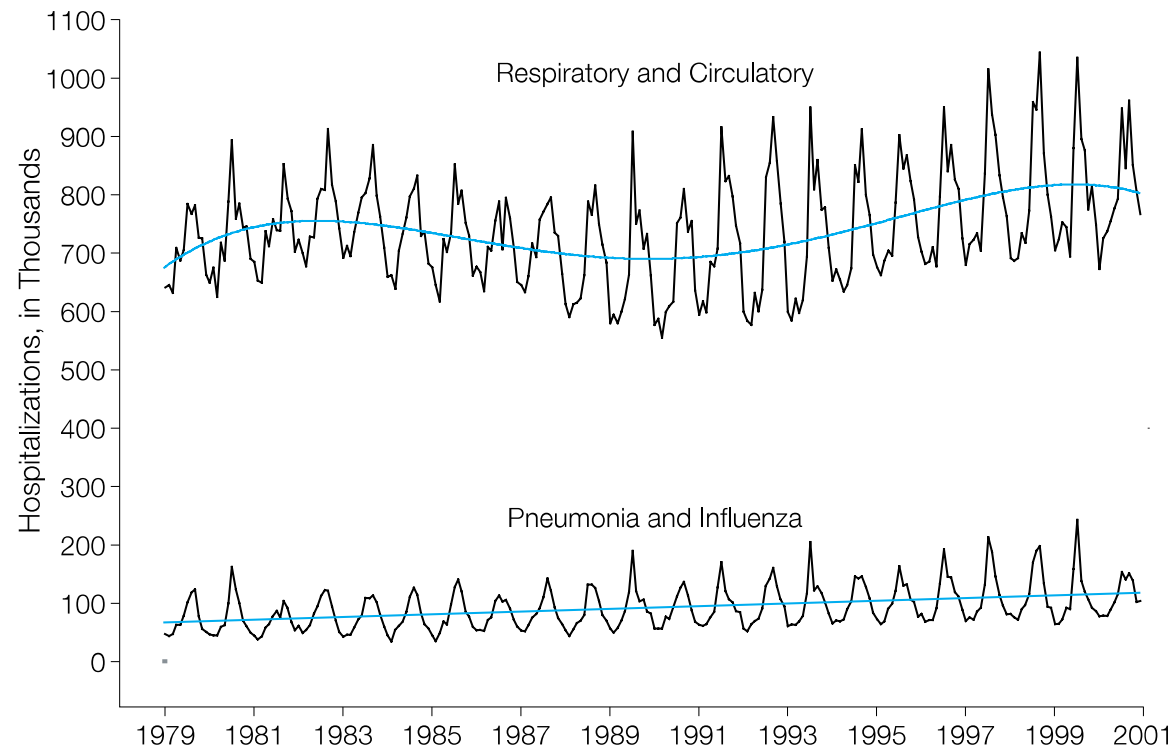


Influenza-Associated Pediatric Deaths by Week of Death, 2017-2018 season to 2020-2021 season



Hospitalizations

Figure. Monthly Numbers of Hospitalizations by Primary Discharge Type From the 1979-1980 Through 2000-2001 Respiratory Seasons



Thompson, W. W. et al. JAMA 2004;292:1333-1340.

Influenza Clinical Features

- Systemic signs/symptoms early; sudden
 - Fever, chills, arthralgias, myalgias, cephalgia
- Cough, sore throat follow
- Incubation period 1 – 5 days
 - **Shed virus 24° before symptoms**
 - Attack rate 5 – 20%
- Fever lasts 3 – 7 days
- Pneumonia
 - Influenza – progressive worsening
 - Bacterial – 7-14 d later, “improving”

Diagnosis

- Clinical evidence during high prevalence
 - Worked until this year!
- Clinically difficult to distinguish influenza from COVID–19
- Holy Grail: multiplex PCR
 - Generally for ED/clinical lab use (at present)
 - Supply constraints & cost, training
- Rapid antigen & other molecular tests
 - Some better than others; not as good as PCR

Diagnosis (2)

Outpatient Clinic or Emergency Department Patients with Acute Respiratory Illness Symptoms (With or Without Fever)*

Does the Patient Require Hospital Admission?

YES

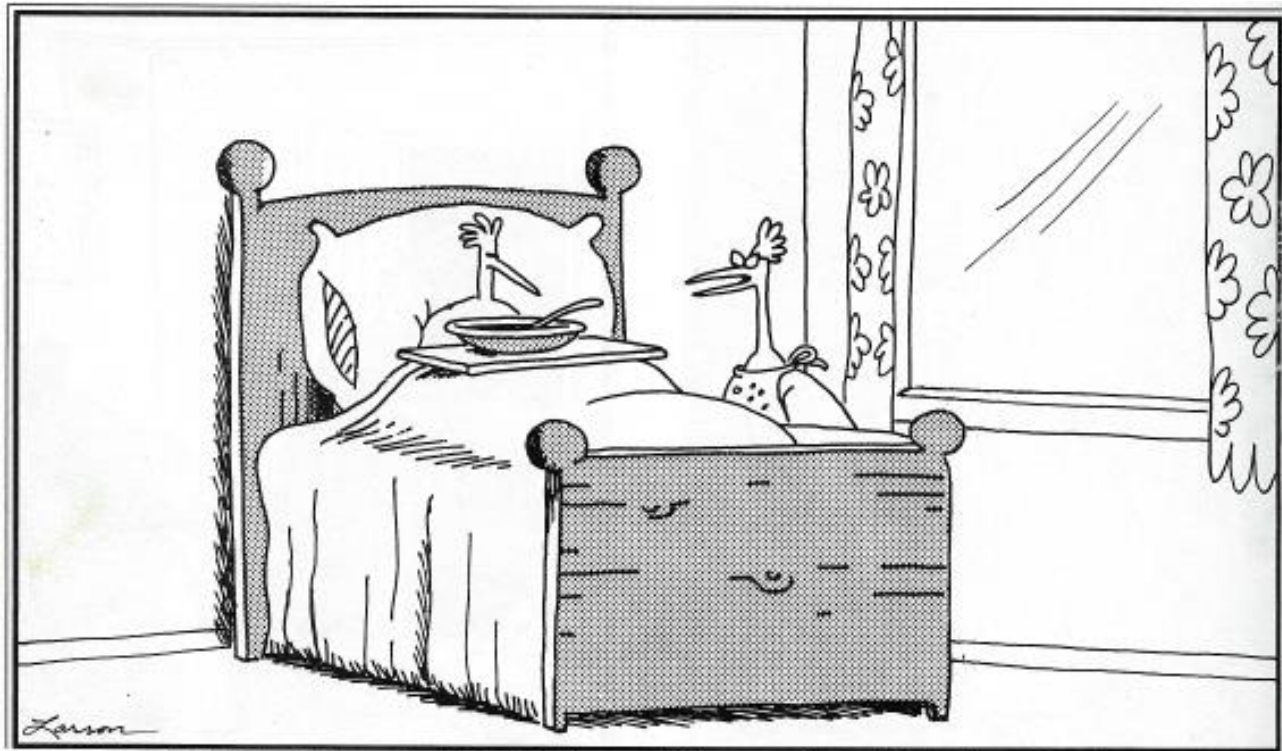
1. Specimen collection
 - Implement recommended infection prevention and control measures and collect respiratory specimens for influenza and SARS-CoV-2 testing.¹ (Two different specimens may need to be collected if multiplex testing is unavailable).
2. SARS-CoV-2 and Influenza Testing
 - a) Order multiplex nucleic acid detection assay for influenza A/B/SARS-CoV-2.^{2,3} OR
 - b) If multiplex nucleic acid detection assay is not available, order SARS-CoV-2

NO

- Follow recommended infection prevention and control measures¹
1. SARS-CoV-2 Testing

Test for SARS-CoV-2 by nucleic acid detection^{2,3}; OR if not available, by SARS-CoV-2 antigen detection assay.⁵
 2. Influenza Testing and Treatment
 - a) Test for influenza if results will change clinical management or for infection control decisions (e.g. long-term care facility resident returning to a facility, or a person of any age returning to a congregate

Treatment



"Quit complaining and eat it! ... Number one, chicken soup is good for the flu—and number two, it's nobody we know."

- Not everyone needs antivirals...but ok to use
- Antibiotics **only** if bacterial infection present

Antiviral Drugs (A & B)

- Neuraminidase Inhibitors
 - Oseltamivir (*po*), zanamivir (inhaled), peramivir (IV, single dose)
 - Best if taken early (<48 hrs of onset)
 - Shorten illness by ~1–3 days
 - *May* prevent complications
- Transcription Inhibitor
 - Baloxavir (*po*, single dose)
 - **Acute, uncomplicated, outpt ONLY**
 - Increased ®

Who *should* be treated?

- Hospitalized, severe disease
- High risk patients
 - Age: < 2 years old, \geq 65 years old
 - Chronic medical conditions (not isolated HTN)
 - Immunosuppression, including HIV infection
 - Pregnant/postpartum (\leq 2 wks after delivery) women
 - \leq 19 years old receiving long-term ASA/salicylates
 - American Indians/Alaska Natives
 - Extreme obesity (BMI \geq 40)
 - Residents of nursing homes/chronic care facilities
- **Oseltamivir x 5d – consider even if >48 hrs**

Who should get *prophylaxis*?

- Targeted, to prevent ®
 - Unimmunized, higher risk for complications and a close contact of a case during the infectious period
 - Poor response to vaccine or unable to be vaccinated
 - Institutional outbreaks (≥ 2 cases), along with other measures
- **Oseltamivir or zanamivir** only, 7–14d
 - Baloxavir not studied or indicated

Prevention



- Non-pharmacologic interventions (NPI)
 - Hand hygiene
 - Distancing, exclusion
 - Mask use
- Immunization

Immunization

- Multiple vaccines now available:
 - Egg grown, cell grown, recombinant
 - IM, quadrivalent (most)
 - A/H1N1 + A/H3N2 + B/Victoria lineage + B/Yamagata lineage
 - 1 has adjuvant, 1 is high-dose: ≥ 65 yrs old
 - IM, trivalent with adjuvant: ≥ 65 yrs old
 - Intranasal, quadrivalent live attenuated

Immunization (2)

- Annual reformulation due to shift/drift
 - Composition based on late prior season
 - Some cross-protection – if similar HA & NA
- Vaccine effectiveness ~48%*
 - Prevention of laboratory proved influenza hospitalization and medical visits
- Decreased mortality
- Financial impact of illness/absenteeism

* – since 2009, excluding major mismatch for 2014-15 season vaccine

Immunization (3)

- Start giving as soon as available
 - October is good (many years)
- Missed opportunities
 - Routine or specialty visits
 - Hospitalization
 - Waiting for a specific vaccine
- **Don't overthink which vaccine to use: just give one!**

Immunization (4)

- Precautions/contraindications
 - Immediate hypersensitivity to eggs
 - **Prior** Guillian–Barre syndrome that occurred ≤ 6 wks from an influenza vaccine
 - Benefit still may outweigh risk
 - LAIV only for ages 2 – 49 years old
 - Not for **immunosuppressed/contacts, pregnant women**, chronic medical conditions, cochlear implants, CSF leaks, 2 – 17 years old who are receiving aspirin/salicylate, 2 – 4 years old who have asthma or history of wheezing in the past 12 months

Immunization (5)

- Common side effects
 - Pain/erythema at injection site
 - Fever, arthralgia, myalgia
 - URI symptoms with LAIV

Targeted Groups

- **EVERYONE** ≥ 6 months old!
 - Mandatory immunization for HCWs
- Prepare for the “vaccine hesitant”
 - You CANNOT get flu from the flu shot.
 - You will not get mercury poisoning.
 - Tamiflu[®] is not as good as you think.
 - There are egg protein free vaccines.
 - “I never get flu” does not predict the future.
 - GBS more likely after influenza than vaccine.

References

- CDC
 - <https://www.cdc.gov/flu/professionals/index.htm>
 - https://www.cdc.gov/mmwr/volumes/69/rr/rr6908a1.htm?s_cid=rr6908a1_w
 - <https://www.cdc.gov/flu/vaccines-work/vaccineeffect.htm>
- IDSA
 - <https://www.idsociety.org/practice-guideline/influenza/>
- NYSDOH
 - <https://www.health.ny.gov/diseases/communicable/influenza/surveillance/>