



# Novel and Variant Influenza

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# Types of Influenza

- Influenza A

- Subtypes (H1N1, H3N2, etc)
  - Variants/Strain
    - A/California/7/2009 (H1N1)
    - A/Perth/16/2009 (H3N2)

- Influenza B

- Lineages (Yamagata and Victoria)
  - Variants/Strain
    - B/Brisbane/60/2008

- Influenza C

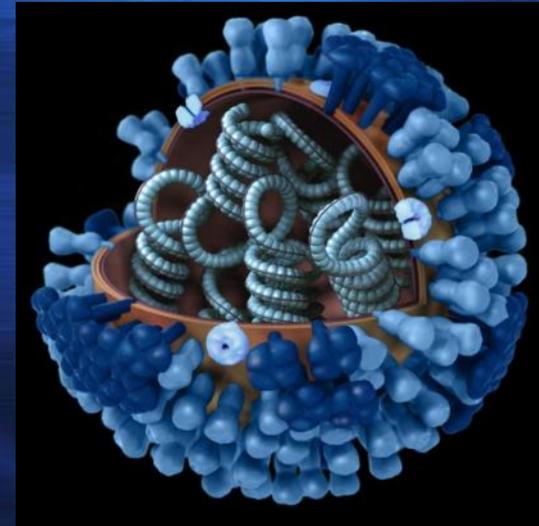


Image from CDC PHIL

# What is a novel or variant influenza?

- An influenza virus that is not known to widely circulate in humans
- Novel vs variant??
- Examples:
  - New strains: pdmH1N1, H3N2<sup>v</sup>
  - New subtypes: H7N9, H5N1



# Seasonal – Novel - Pandemic Flu

- Seasonal Flu

- Viruses have been circulating in human populations for several seasons, allowing people to build up immunity.

- Variant / novel flu

- Virus has not been circulating in human populations; little to no immunity is expected in the general population; rare or limited person to person spread

- Pandemic Flu

- Virus has not been circulating in human populations; little to no immunity is expected in the general population; **now** spreading person to person.

# Spectrum of Disease



Severity of Illness: Hospitalizations and Deaths ↑

# Current Influenza Threats

## H7N9

- Cases: 133
- Deaths: 44 (33%)
- First Onset: 2/19/13
- Last Onset: 5/7/13
- Countries: 1 – China
- Poultry / bird markets

## H5N1

- Cases: 628
- Deaths: 374 (60%)
- First Onset: 2003
- Last Onset: 2013
- Countries: 15
- Poultry

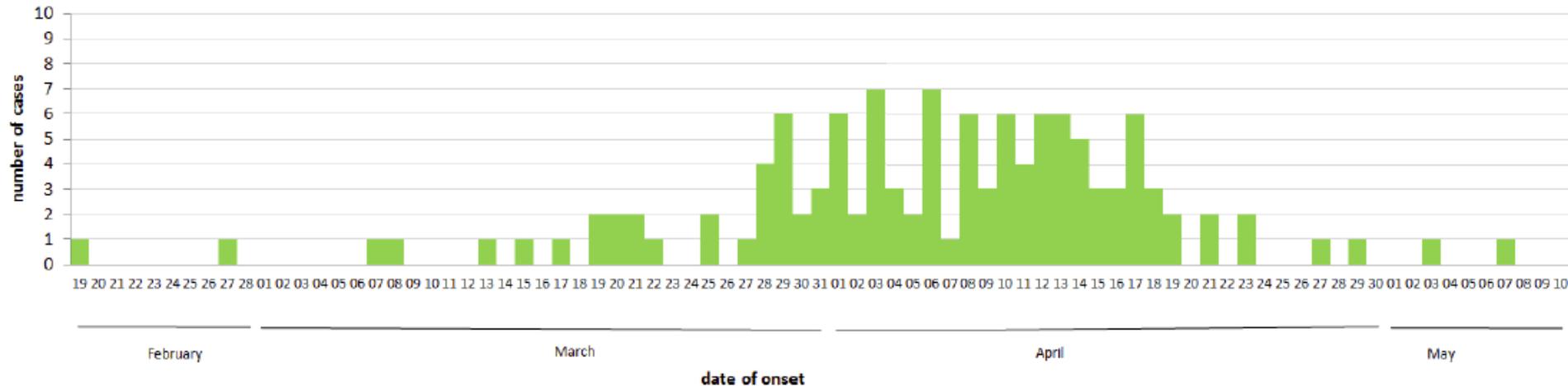
## H3N2v

- Cases: 333
- Deaths: 1 (<1%)
- First Onset: 2011
- Last Onset: 2013
- Countries: 1 – US
- Swine / ag fairs

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- Sporadic infections in humans; many with animal exposure
  - No sustained or community transmission
  - No travel restrictions

# Epidemiological curve of confirmed cases of avian influenza A(H7N9) reported to WHO, by day, 2013

N = 121 confirmed cases for whom date of onset is known



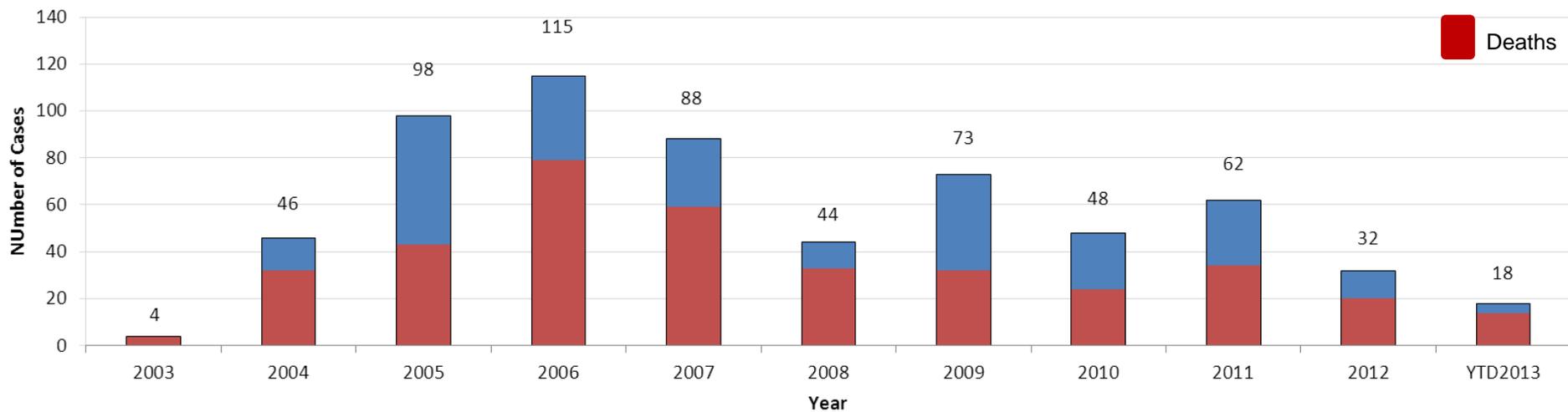
All dates refer to onset of illness

Data in WHO/HQ as of 24 May 2013, 08:00 GMT+1

Source: WHO/GIP

# Epidemiological curve of avian influenza A (H5N1) reported by year

## 2003-2013



# H3N2v

Table 1. Case Count: Detected U.S. Human Infections with H3N2v by State since August 2011

States Reporting H3N2v Cases	Cases in 2011	Cases in 2012	Cases in 2013
Hawaii		1	
Illinois		4	
Indiana	2	138	12
Iowa	3	1	
Maine	2		
Maryland		12	
Michigan		6	
Minnesota		5	
Ohio		107	
Pennsylvania	3	11	
Utah		1*	
West Virginia	2	3	
Wisconsin		20	
<b>Total</b>	<b>12</b>	<b>309</b>	<b>12</b>

## Wash Hands When Leaving Animal Exhibits

### WHO

 Everyone, especially young children, older individuals, and people with weakened immune systems

### WHEN

#### Always Wash Hands:

-  After touching animals or their living area
-  After leaving the animal area
-  After taking off dirty clothes or shoes
-  After going to the bathroom
-  Before preparing foods, eating, or drinking



### HOW

-  Wet your hands with clean, running water
-  Apply soap
-  Rub hands together to make a lather and scrub well, including backs of hands, between fingers, and under fingernails
-  Rub hands at least 20 seconds. Need a timer? Hum the "Happy Birthday" song from beginning to end twice
-  Rinse hands
-  Dry hands using a clean paper towel or air dry them. Do not dry hands on clothing



For more information, visit CDC's Healthy Pets, Healthy People website ([www.cdc.gov/healthy-pets](http://www.cdc.gov/healthy-pets)) and CDC's Handwashing website ([www.cdc.gov/handwashing/](http://www.cdc.gov/handwashing/)).

# Prevention Messages – Travel

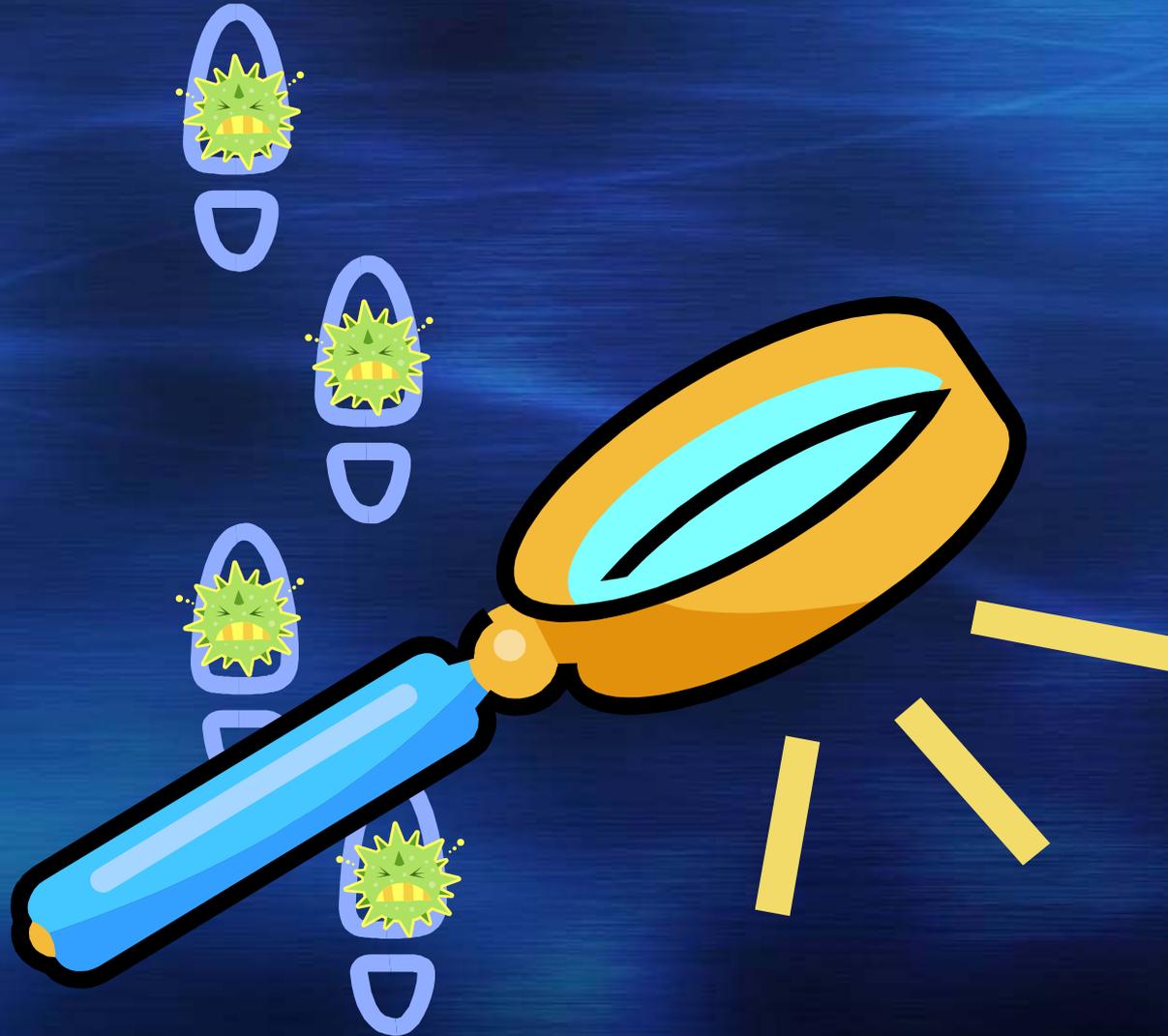
- Do not touch birds, pigs, or other animals.
  - Do not touch animals whether they are alive or dead.
  - Avoid live bird or poultry markets.
  - Avoid other markets or farms with animals (wet markets).
- Eat food that is fully cooked.
  - Eat meat and poultry that is fully cooked (not pink) and served hot.
  - Eat hard-cooked eggs (not runny).
  - Don't eat or drink dishes that include blood from any animal.
  - Don't eat food from street vendors.
- Practice hygiene and cleanliness:
  - Wash your hands often.
  - If soap and water aren't available, clean your hands with hand sanitizer containing at least 60% alcohol.
  - Don't touch your eyes, nose, or mouth. If you need to touch your face, make sure your hands are clean.
  - Cover your mouth and nose with a tissue or your sleeve (not your hands) when coughing or sneezing.
  - Try to avoid close contact, such as kissing, hugging, or sharing eating utensils or cups, with people who are sick.
- See a doctor if you become sick during or after travel to \_\_\_\_\_.
  - See a doctor right away if you become sick with fever, coughing, or shortness of breath.
  - If you get sick while you are still in \_\_\_\_\_, visit the US Department of State website to find a list of local doctors and hospitals. Many foreign hospitals and clinics are accredited by the Joint Commission International. A list of accredited facilities is available at their website ([www.jointcommissioninternational.org](http://www.jointcommissioninternational.org)).
  - Delay your travel home until after you have recovered or your doctor says it is okay to travel.
  - If you get sick with fever, coughing, or shortness of breath after you return to the United States, be sure to tell your doctor about your recent travel to \_\_\_\_\_.

<http://wwwnc.cdc.gov/travel/notices/watch/avian-flu-h7n9-china>

# Prevention Messages – Swine Barns

- Don't take food or drink into pig areas; don't eat, drink or put anything in your mouth in pig areas.
- Don't take toys, pacifiers, cups, baby bottles, strollers, or similar items into pig areas.
- Wash your hands often with soap and running water before and after exposure to pigs. If soap and water are not available, use an alcohol-based hand rub.
- Avoid close contact with pigs if possible.
- Take protective measures if you must come in contact with pigs that are known or suspected to be sick. This includes wearing personal protective equipment like protective clothing, gloves and masks that cover your mouth and nose when contact is required.
- To further reduce the risk of infection, minimize contact with pigs and swine barns.

# Investigating reports



# Testing Criteria

## CDC Criteria

- Specific to situation
- Example for H7N9
  - Flu like illness AND
    - Travel to China within 10 days OR
    - Contact with a confirmed case
- Example for H3N2v
  - Flu like illness AND
    - Exposure to swine or an agricultural fair within 7 days OR
    - Contact with a confirmed case

## DSHS Criteria

- Part of routine surveillance
- Any of the following:
  - extremely severe or unusual presentation,
  - not responding to AV treatment,
  - currently vaccinated,
  - history of animal contact, OR
  - history of international travel

# Notification Scenarios

## Provider Reported

- Routine surveillance
- Specific exposure

- Response to health alert
- Specific exposure

## Laboratory Identified

- Routine surveillance
- Exposure unknown

# Receiving Calls

## **CDC Criteria are met:**

- Call Lesley or Carol at 512-776-7676 as soon as possible
- Review provided health alert.
- Use the 2012-2013 Laboratory Influenza Surveillance Protocol to collect and submit specimens. Please note that an NP swab is preferred.
- DSHS will pay for testing.
- Submit the specimen to the DSHS lab in Austin or one of the LRNs and make sure to write reason for submission on the form

## **DSHS Criteria are met:**

- Call Lesley or Carol at 512-776-7676 before you submit the specimen
- Use the 2012-2013 Laboratory Influenza Surveillance Protocol to collect and submit specimens. Please note that an NP swab is preferred.
- DSHS will pay for testing
- Submit the specimen to one of the LRNS or to the DSHS lab in Austin and make sure to write the reason on the form

# Receiving Calls Cont.

- Neither agency's criteria are met:
  - If the provider **is** a current ILINet provider or a current influenza surveillance specimen submitter
    - then DSHS will pay for testing and
    - specimens may be submitted as normal.
  - If the provider **is not** a current ILINet provider or current influenza surveillance specimen submitter,
    - they are welcome to send their specimen to any commercial lab.
    - DSHS will not pay for testing.

# Initial Investigation (Provider Reports)

- Similar to routine flu activities
  - No change in specimen collection and submission
  - Routine flu testing done first
  - Always interested in travel / animal history
- Key differences
  - Give DSHS a heads up
  - Testing can be prioritized
    - On the G-2A write the reason such as “Travel to China” in the white space under the virology section.
  - Fill out the General Influenza Investigation Form
  - Infection control guidance may be stricter
  - If you get an actionable result...

# Actionable Results

- Unsubtypable
  - Flu A + but negative for seasonal markers
- Presumptive positive
  - Specific set of results not indicative of seasonal flu but consistent with previously identified variant or novel flu viruses
- Confirmed
  - Positive by a CDC approved test

# Next Investigation Steps

- Collect extensive history
  - interview / medical records review
- Complete provided CDC investigation form
- Conduct contact tracing
- Enhance ILI surveillance
- Participate in specimen surge testing if needed

# Enhancing ILI Surveillance

- Ensure your usual reporters are reporting!
- Follow up with other entities in the area to see if any increases have occurred recently
  - Hospitals, clinics, schools, etc
- Do targeted surveillance around the case
  - School / workplace, nearby clinics, etc
- Consider calling each site weekly

# Contact Tracing

## Identify contacts (H7N9 example)

- Anyone coming within about 6 feet of a confirmed case while the case was ill beginning 1 day prior to illness onset and continuing until resolution of illness
- Includes healthcare personnel providing care for a confirmed case, family members of a confirmed case, persons who lived with or stayed overnight with a confirmed case, and others who have had similar close physical contact.

## Follow up with contacts

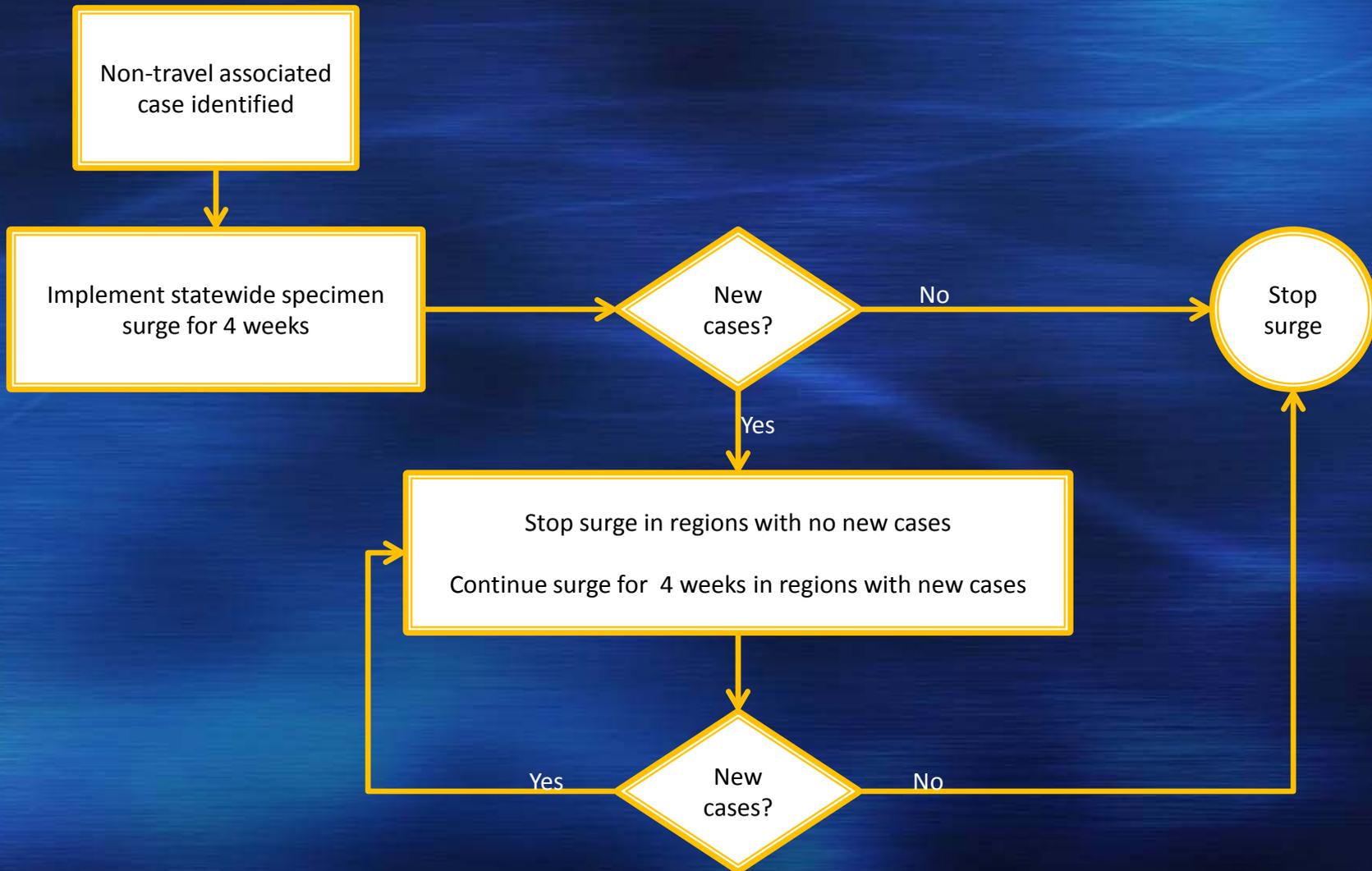
- Advise contacts of symptoms
- Monitor for development of symptoms

## Prioritize contacts for testing

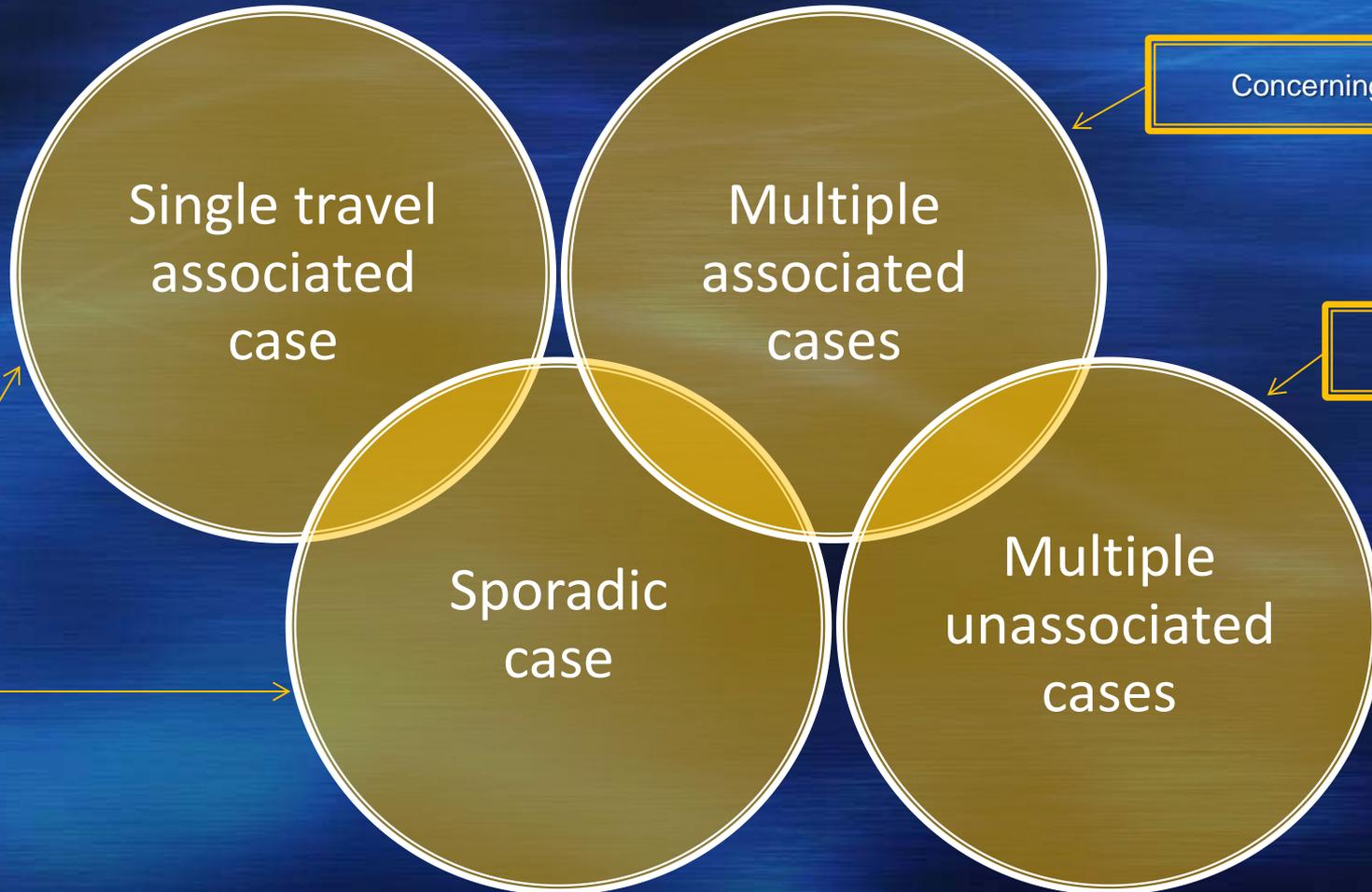
- Collect specimens from any ill contacts



# Specimen Surge Draft



# Possible Investigation Outcomes



Concerning

Alarming

Expected  
to  
happen  
on  
occasion

# Want more information?

- CDC Website

- [www.cdc.gov/flu/swineflu/h3n2v-cases.htm](http://www.cdc.gov/flu/swineflu/h3n2v-cases.htm)
- [www.cdc.gov/flu/avianflu/h7n9-virus.htm](http://www.cdc.gov/flu/avianflu/h7n9-virus.htm)

- WHO Website

- [www.who.int/influenza/human\\_animal\\_interface/H5N1\\_cumulative\\_table\\_archives/en/](http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/)

- CIDRAP

- [www.cidrap.umn.edu/](http://www.cidrap.umn.edu/)

- ProMed Mail

- [www.promedmail.org/](http://www.promedmail.org/)