

Hawaii Influenza Surveillance Program



Ranjani Rajan
Hawaii Department of Health
Disease Outbreak Control Division: Disease Investigation Branch

Outline

- Influenza Viruses
- Pandemic Influenza
- Hawaii Influenza Surveillance
- HDOH Pandemic Preparedness Plans
 - Changes to Influenza Surveillance

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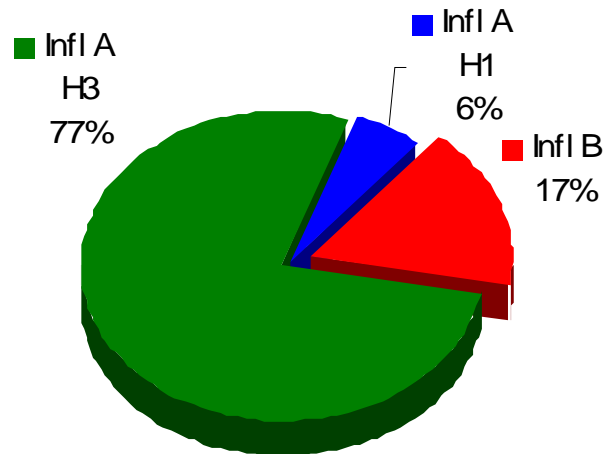
Influenza Viruses

- Typed based on Nucleoprotein
- Sub-typed based on Surface Protein
 - Hemagglutinin (HA) [16]
 - Neuraminidase (NA) [9]

Influenza Viruses

	Influenza A		Influenza B
	H3N2	H1N1	
Flu Season 2005-06	735 (77)	53 (6)	160 (17)
Summer 2006	1 (1)	90 (53)	79 (46)
Flu Season 2006-07	22 (23)	72 (74)	3 (3)

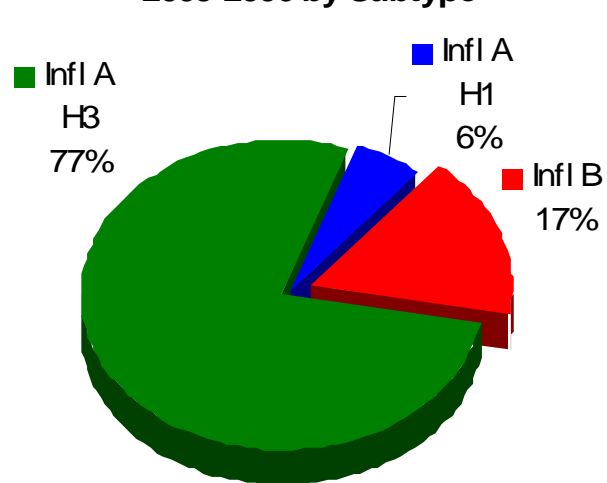
Influenza Cases, Flu Season
2005-2006 by Subtype



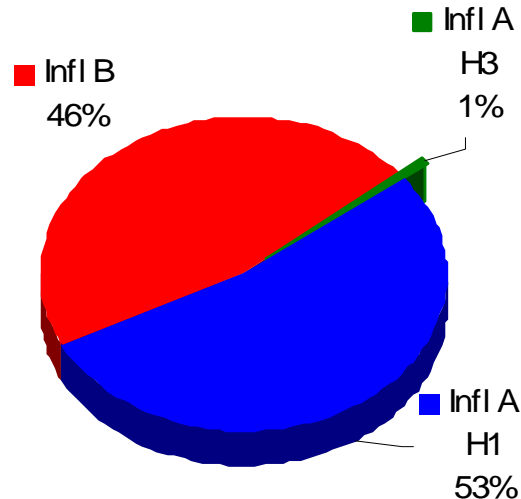
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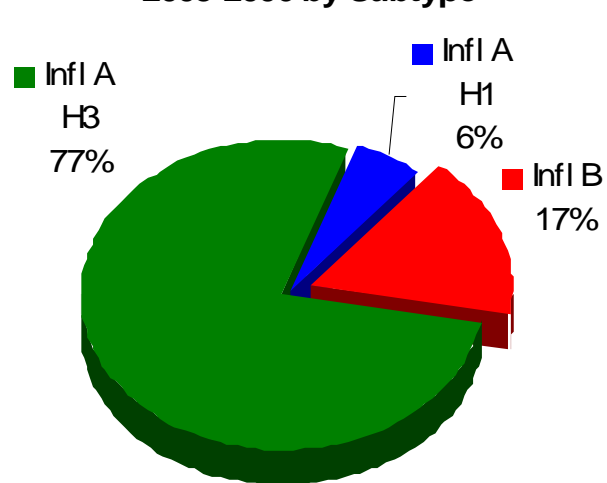
Influenza Cases, Summer 2006



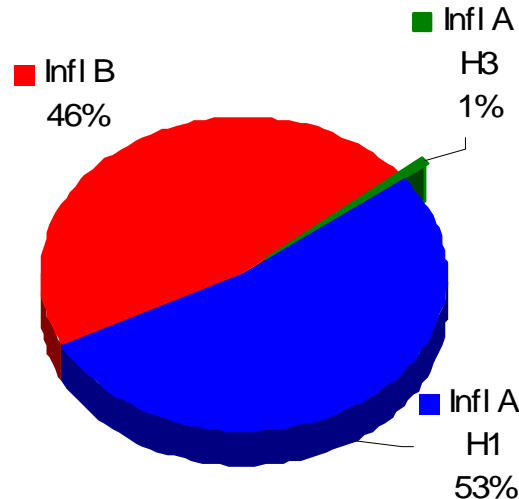
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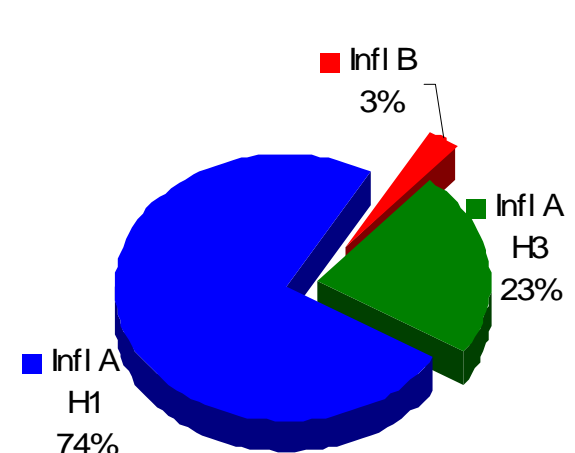
Influenza Cases, Flu Season 2005-2006 by Subtype



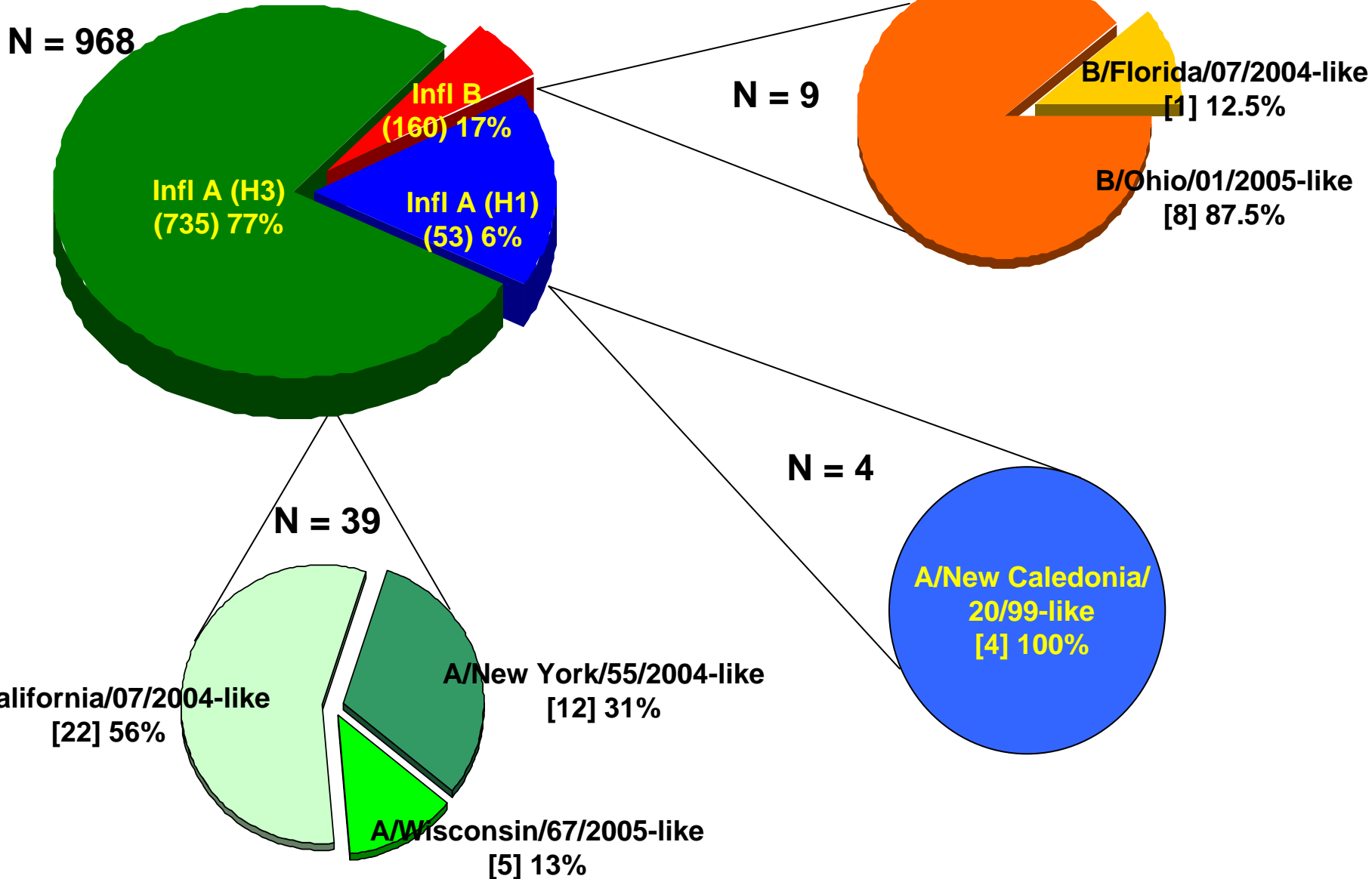
Influenza Cases, Summer 2006



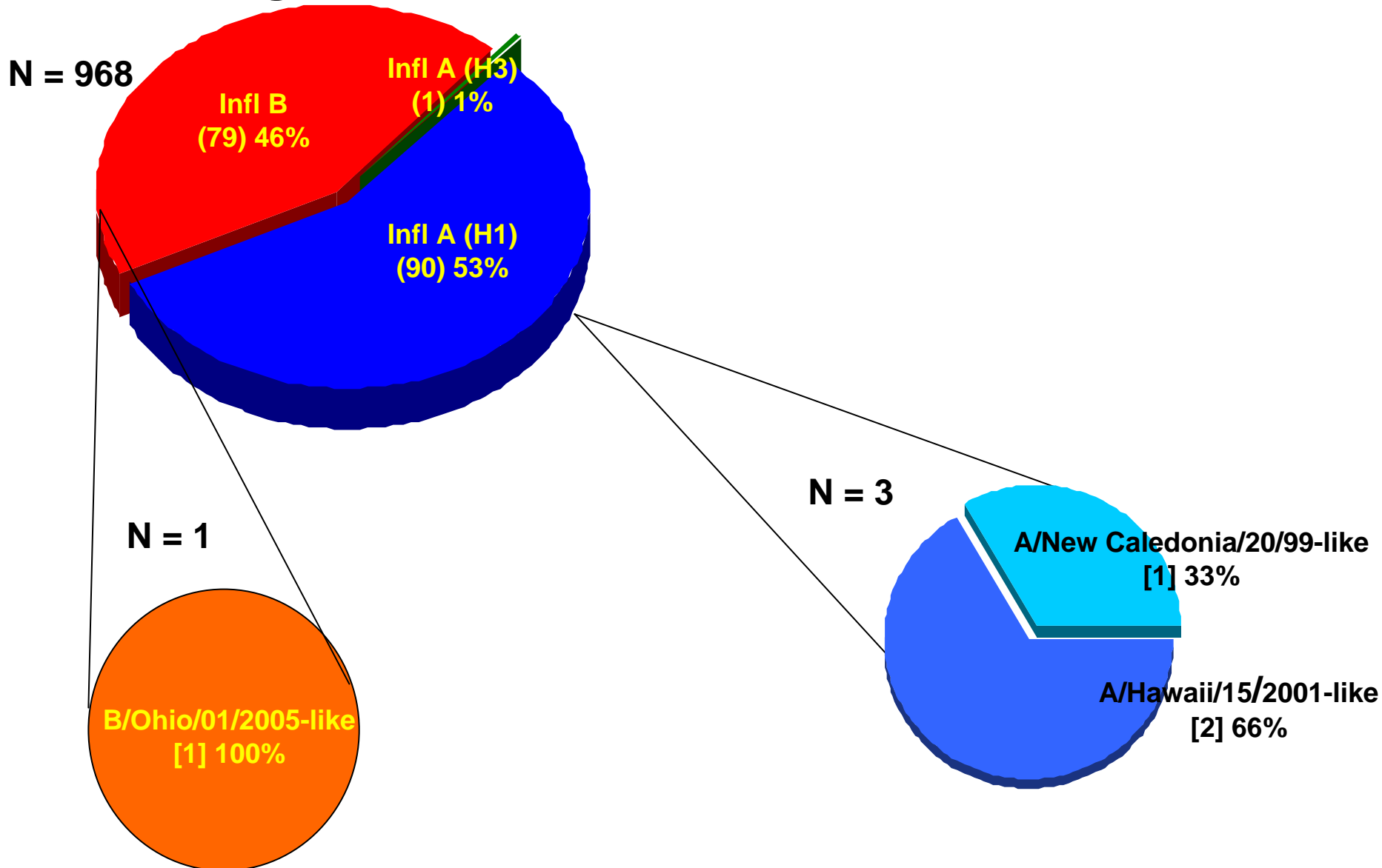
Influenza Cases, Flu Season 2006-2007



Flu Season 2005-06 Influenza Viruses Reported to Hawaii & Antigenic Characterization of Tested Subsets



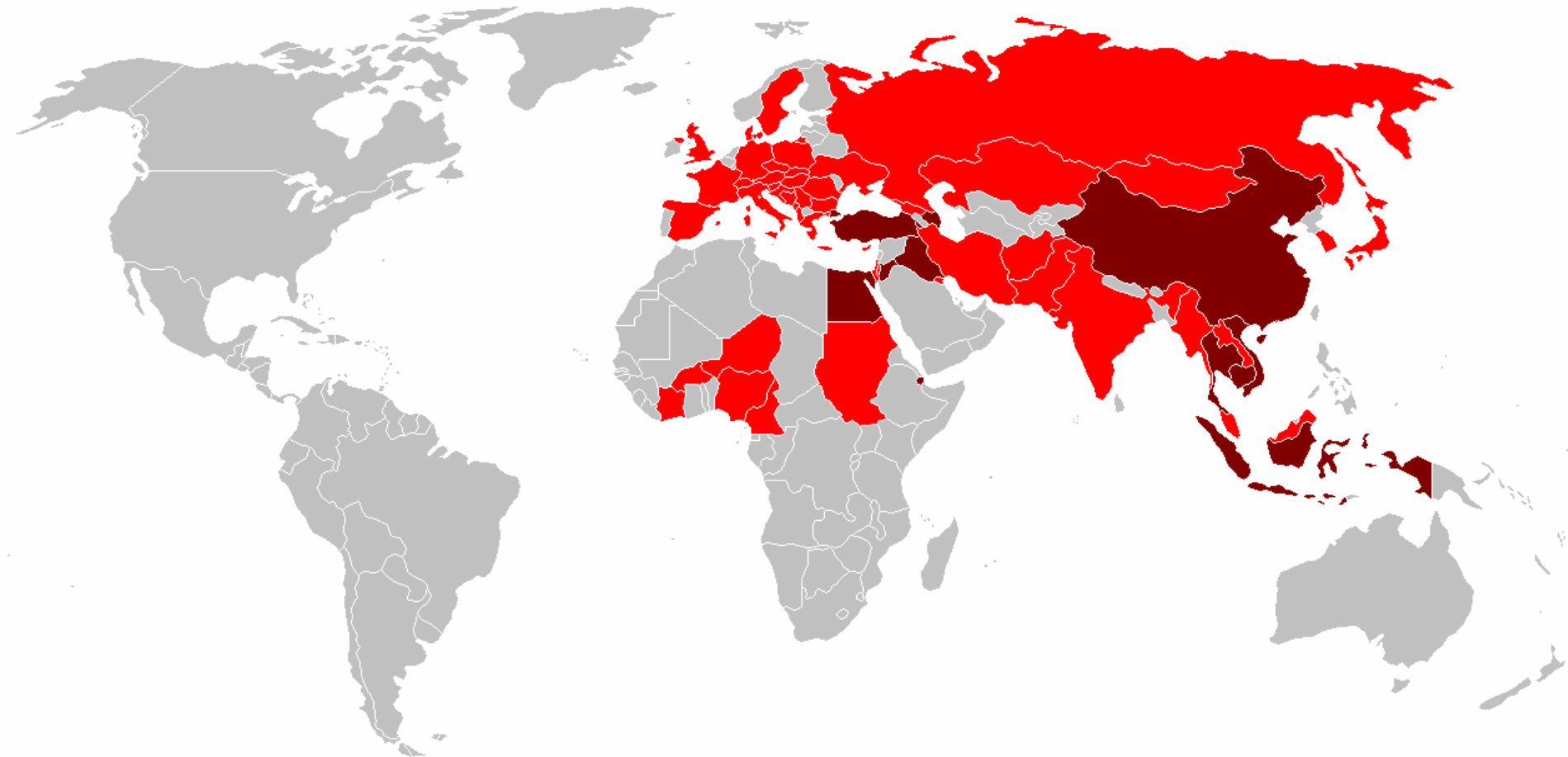
Summer 2006 Influenza Viruses Reported to Hawaii & Antigenic Characterization of Tested Subsets



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Global Spread of H5N1 since 2003



Countries with poultry or wild birds killed by H5N1.

Countries with humans, poultry and wild birds killed by H5N1.

Source: World Health Organization; as of 29 November 2006

Influenza Pandemics of the 20th Century



Credit: US National Museum of Health and Medicine



1918: “Spanish Flu”
A(**H1N1**)

20-40 m deaths

675,000 US deaths

1957: “Asian Flu”
A(**H2N2**)

1-4 m deaths

70,000 US deaths

1968: “Hong Kong Flu”
A(**H3N2**)

1-4 m deaths

34,000 US deaths

USA	Illness	Hospitalization	ICU Care	Deaths
Moderate	87,000,000	719,000	107,850	209,000
Severe	87,000,000	8,500,000	1,300,000	1,900,000

USA	Illness	Hospitalization	ICU Care	Deaths
Moderate	30%	0.25%	0.04%	0.07%
Severe	30%	2.93%	0.45%	0.66%

Hawaii	Illness	Hospitalization	ICU Care	Deaths
Moderate	382,558	3,471	521	1,009
Severe	382,558	41,034	6,276	9,172

USA pop. = 290 m and Hawaii pop. = 1.4 (with visitors)

Hawaii Pandemic Influenza Preparedness & Response

- Command and control
- **Influenza surveillance**
- Pandemic influenza vaccines
- Antiviral medications
- Isolation & quarantine
- Health care delivery
- Communications

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Hawaii Influenza Surveillance



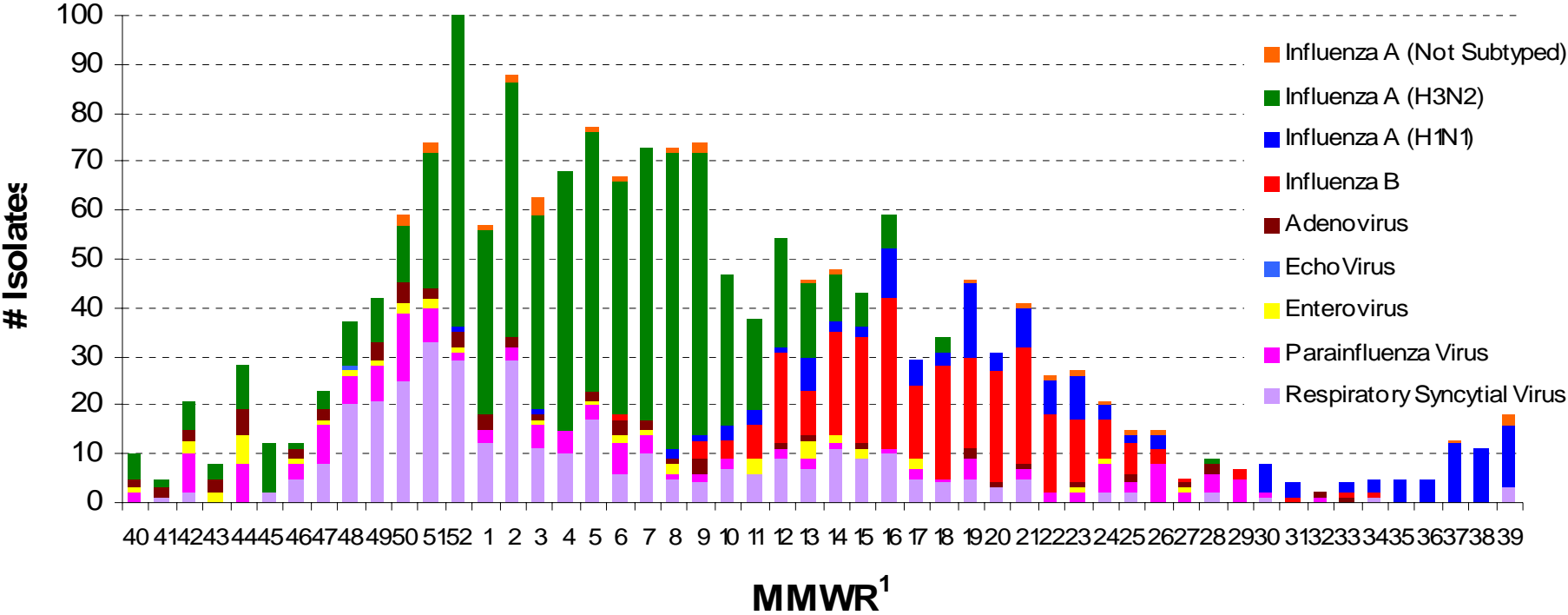
Hawaii Influenza Surveillance



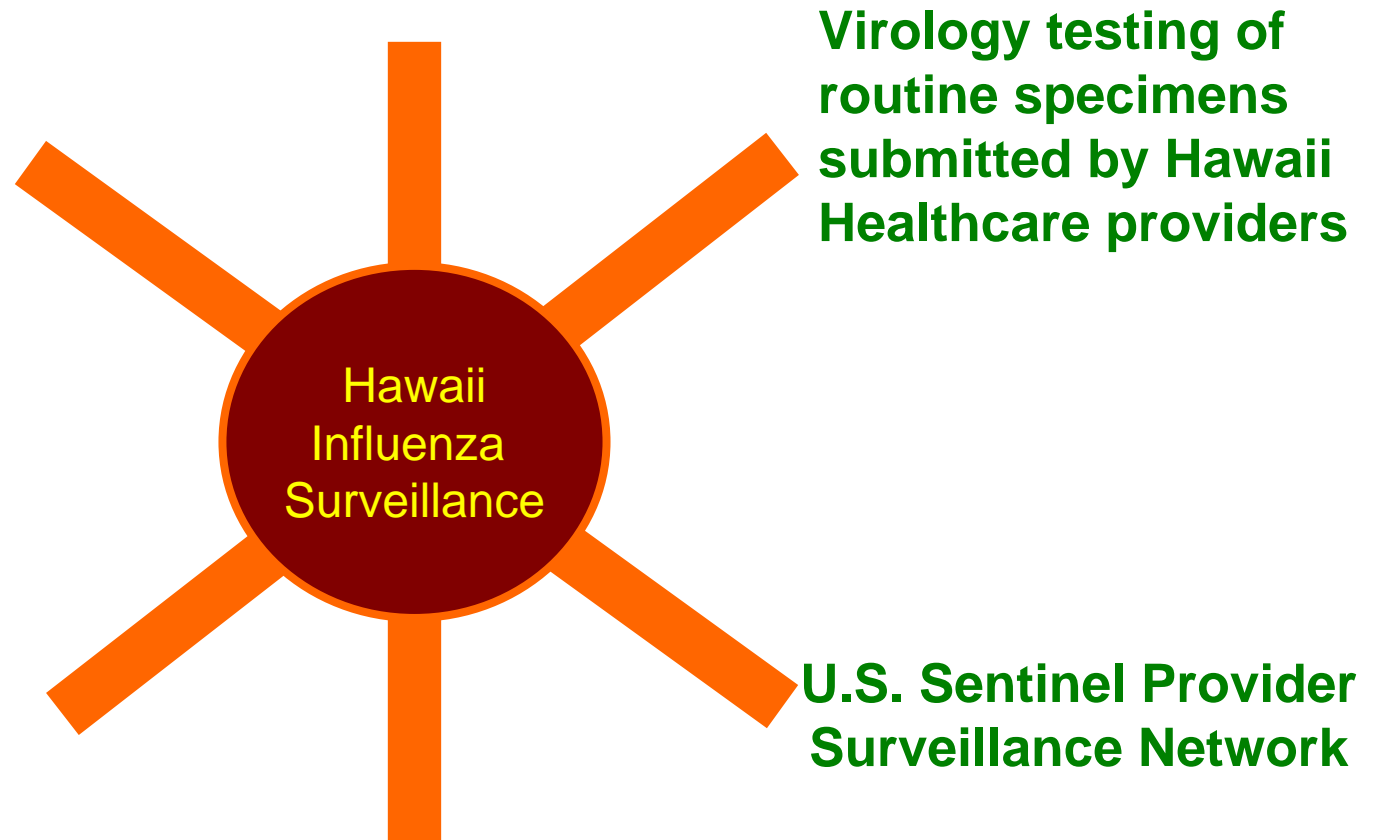
**Virology testing of
routine specimens
submitted by Hawaii
Healthcare providers**

Virology testing of routine specimens submitted by Hawaii Healthcare providers

All Respiratory Isolates Beginning
Flu Year 2005-2006

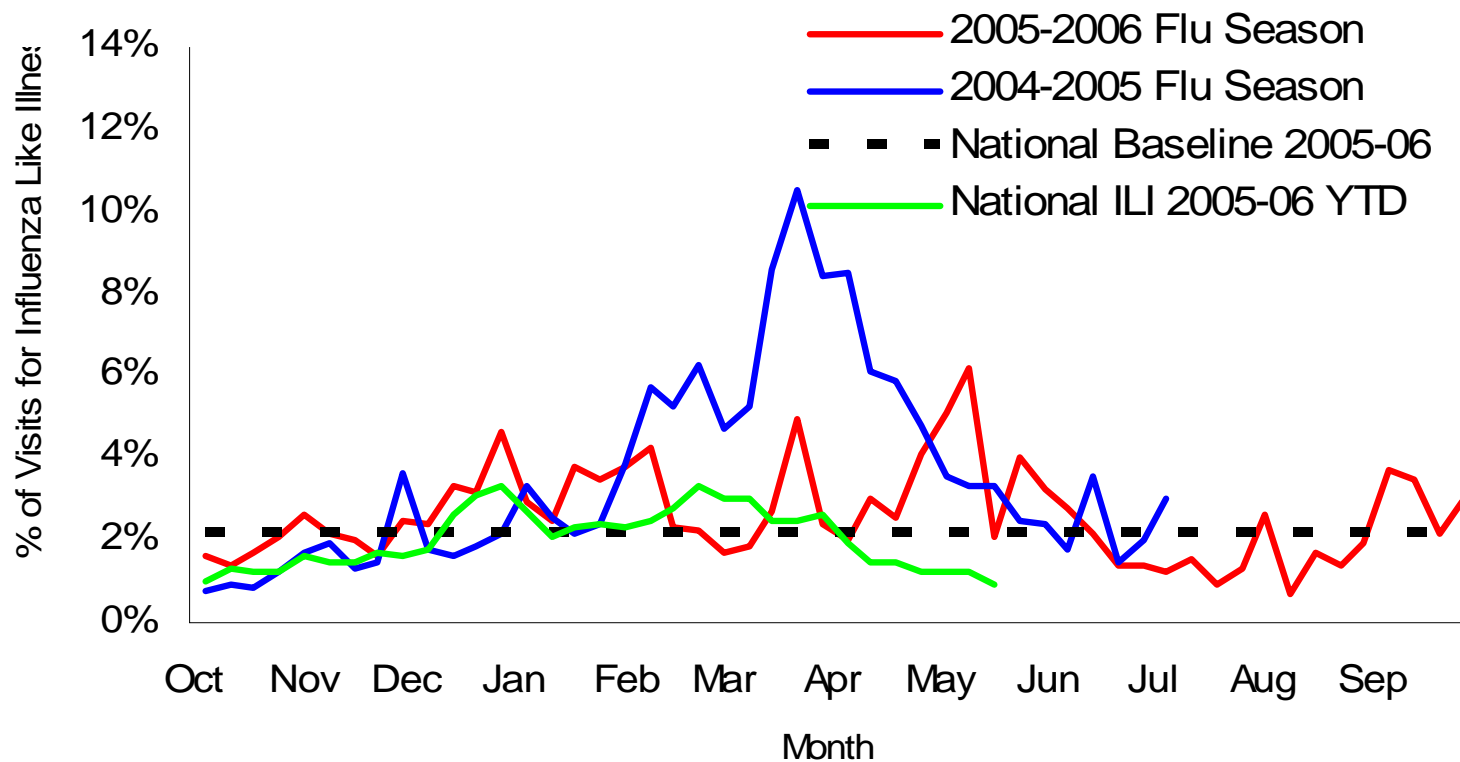


Hawaii Influenza Surveillance



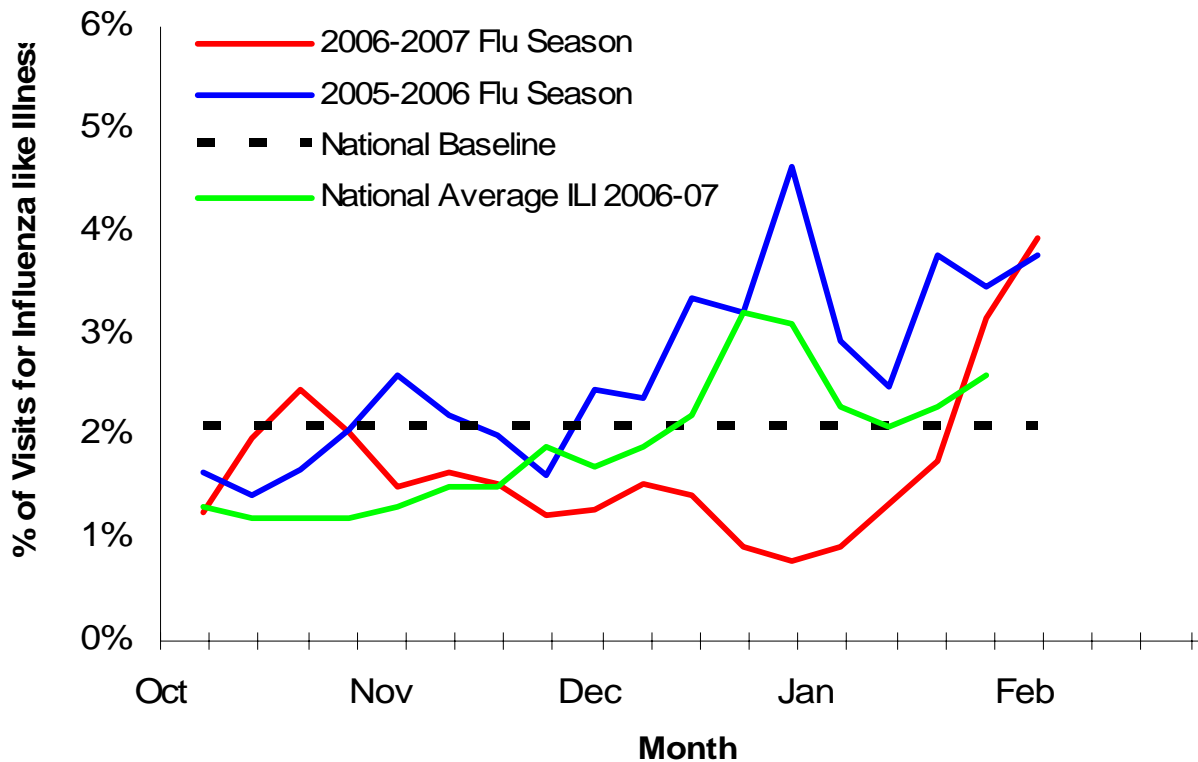
U.S. (Hawaii) Sentinel Provider Surveillance Network

Percentage of Visits for Influenza Like Illness (ILI)
Reported by Hawaii Sentinal Providers

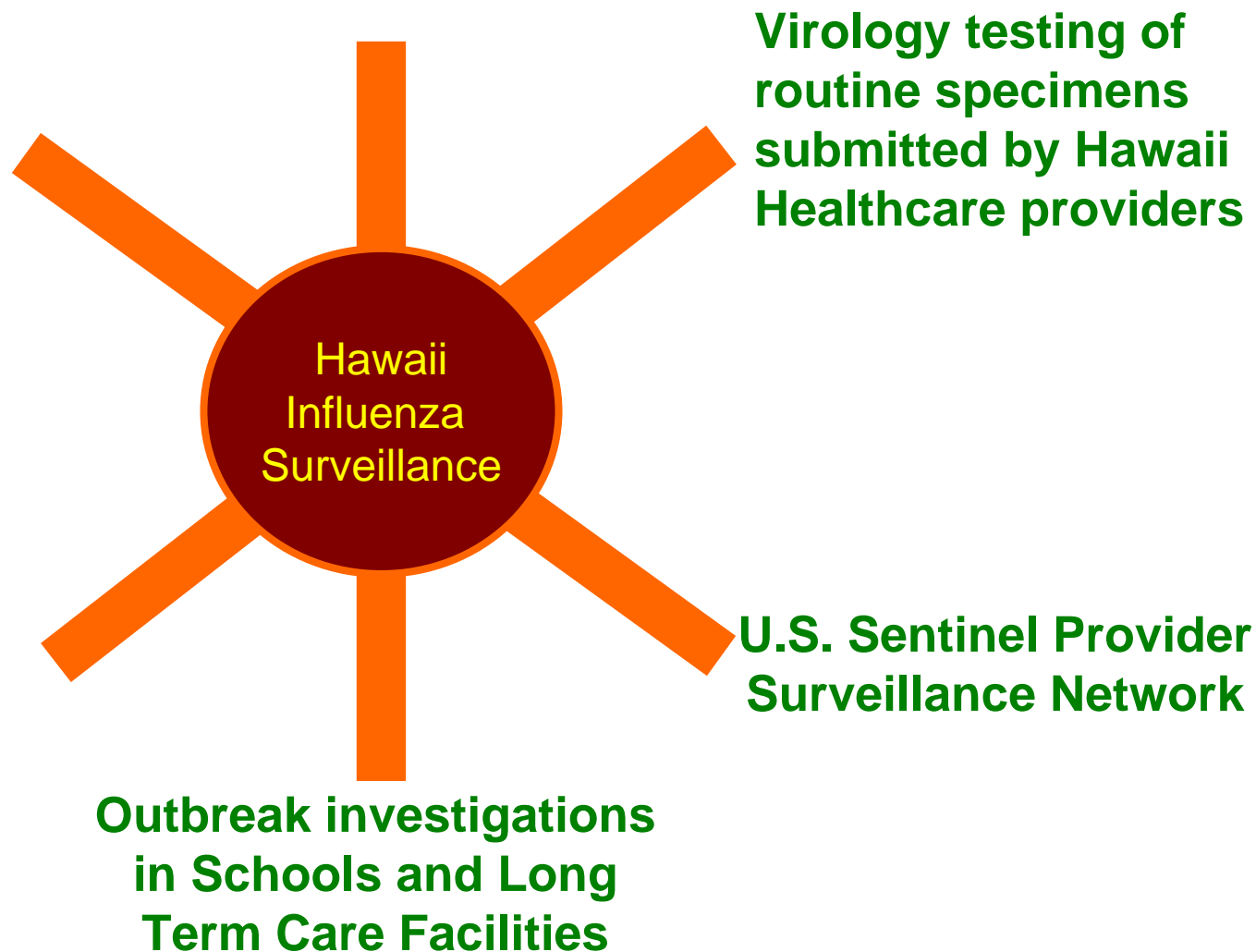


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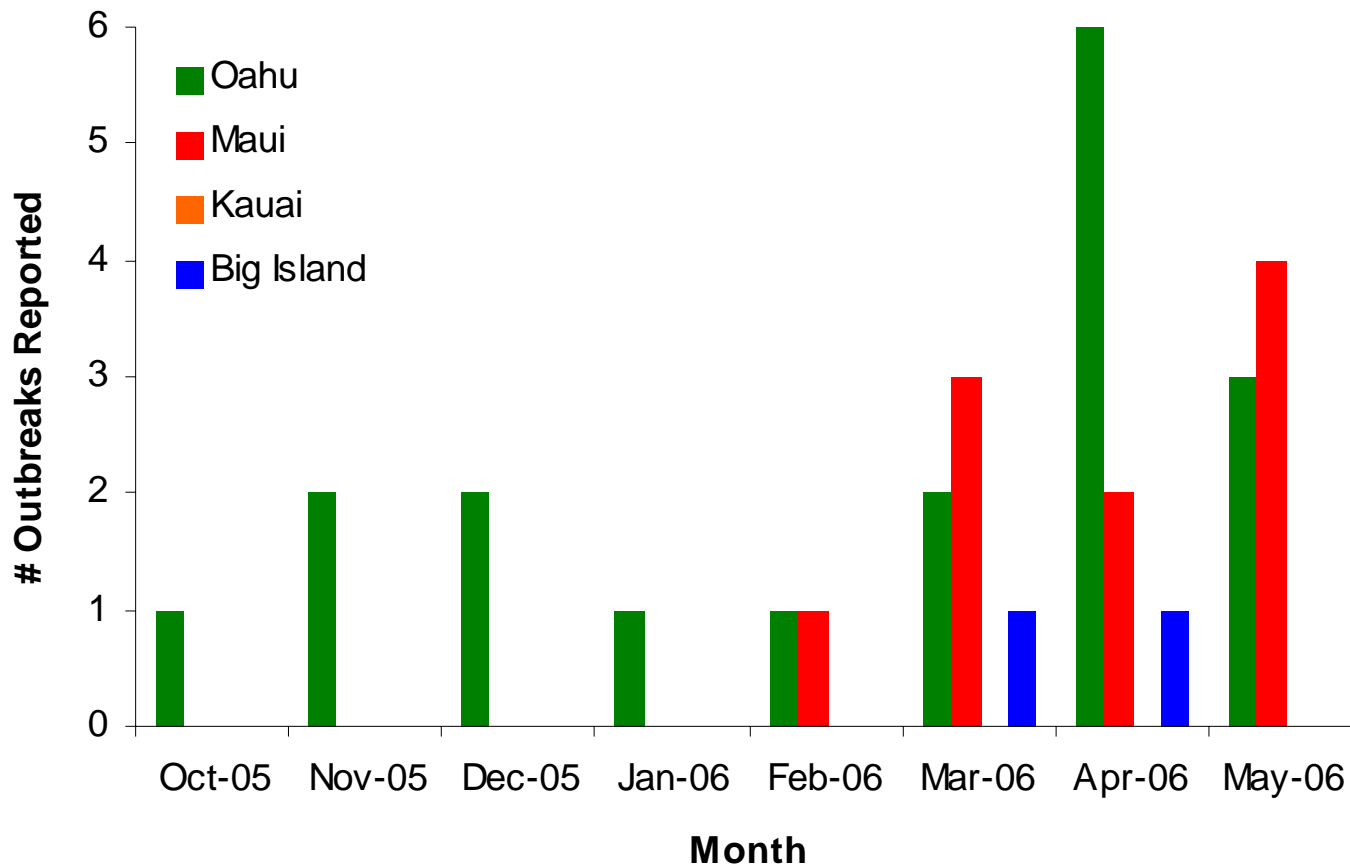
Hawaii Influenza Surveillance



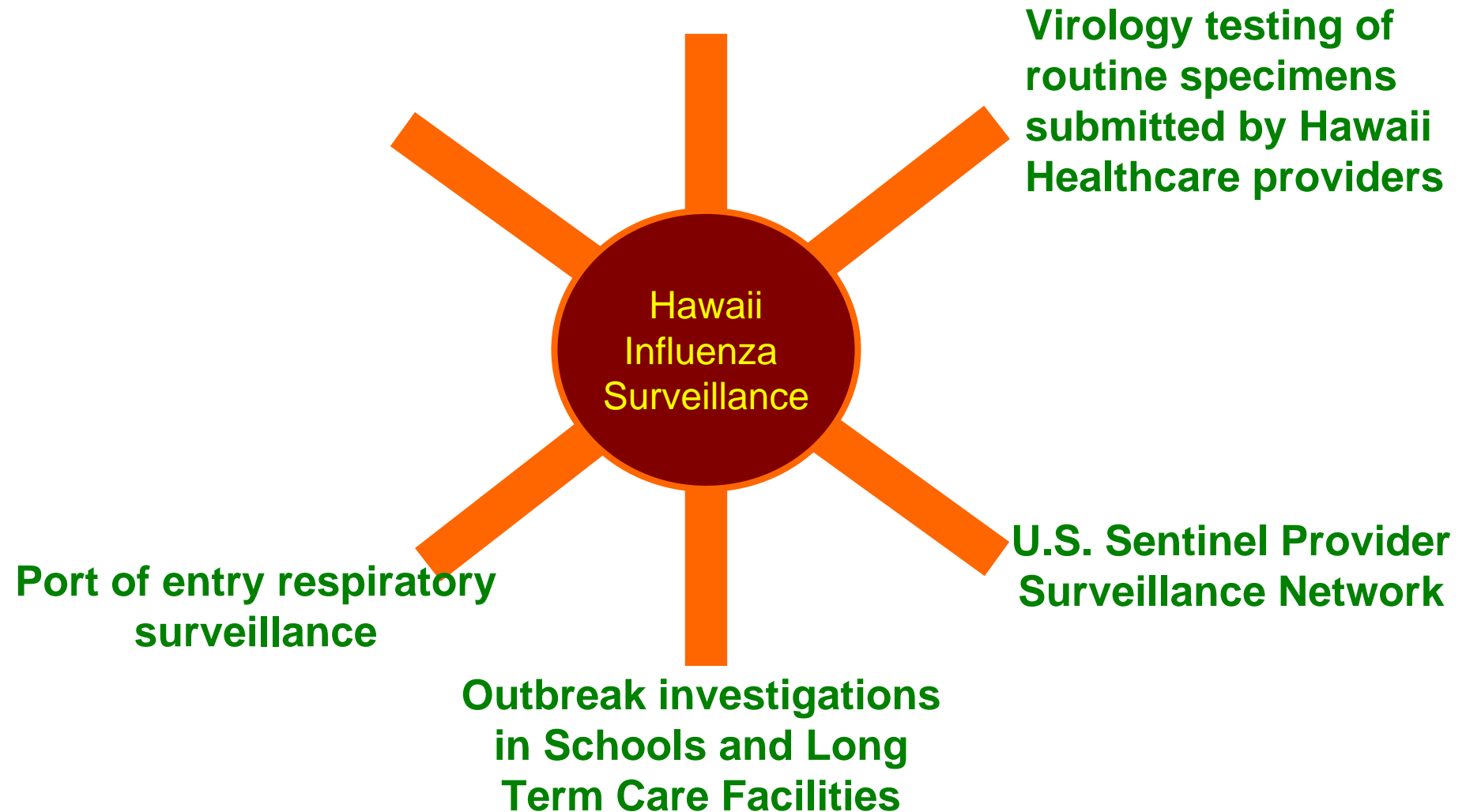
Outbreak investigations in Schools and Long Term Care Facilities

N = 30

ILI Outbreaks by Month and County, Hawaii, 2005-06



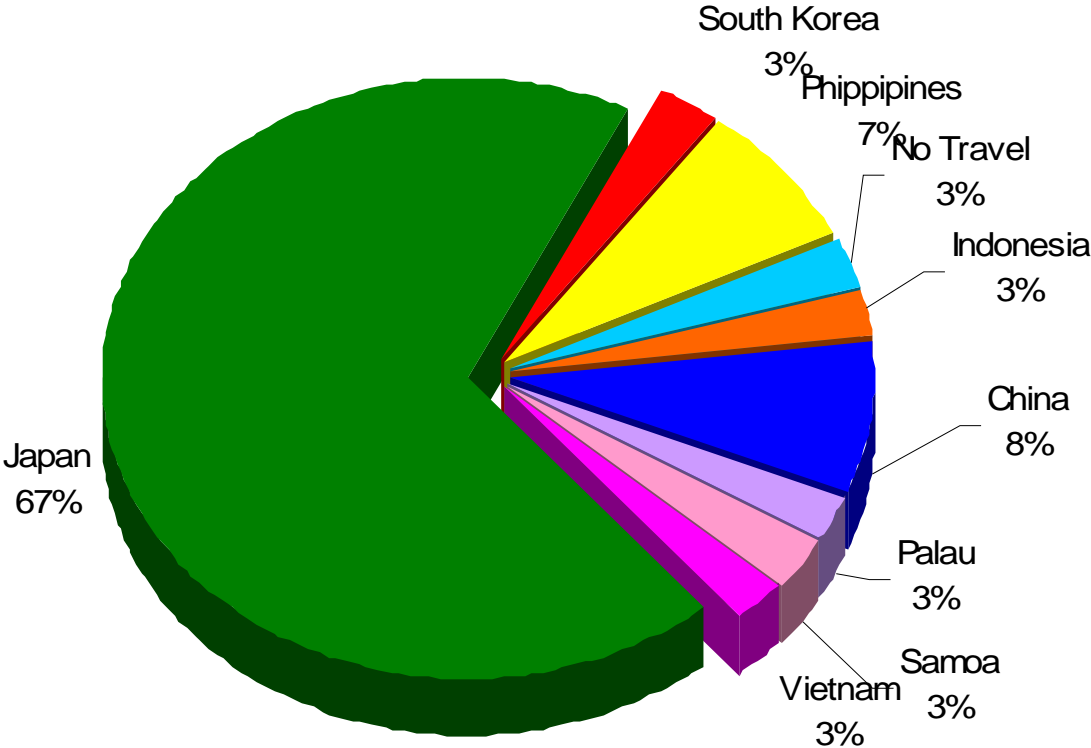
Hawaii Influenza Surveillance



Port of Entry Surveillance

Hawaii Airport Surveillance Program

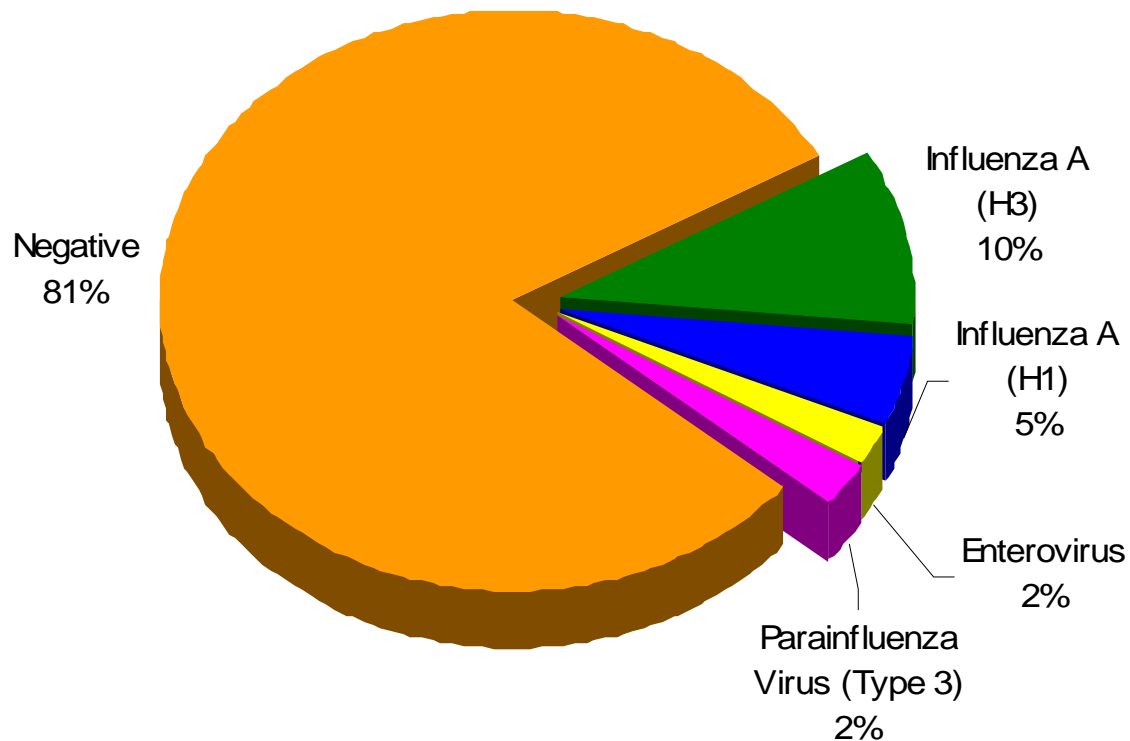
November 1, 2005 – November 1, 2006
N=41



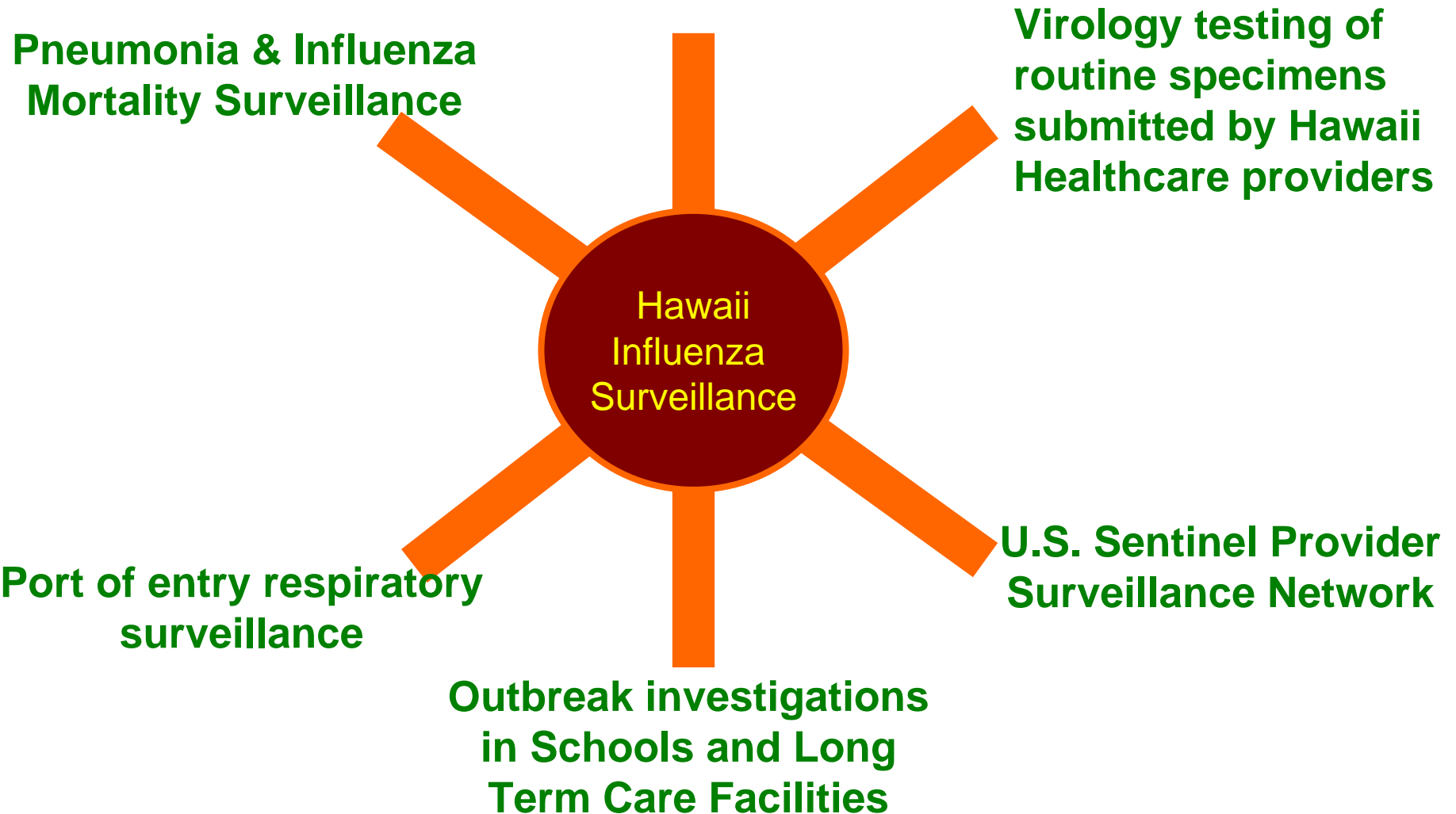
Port of Entry Surveillance

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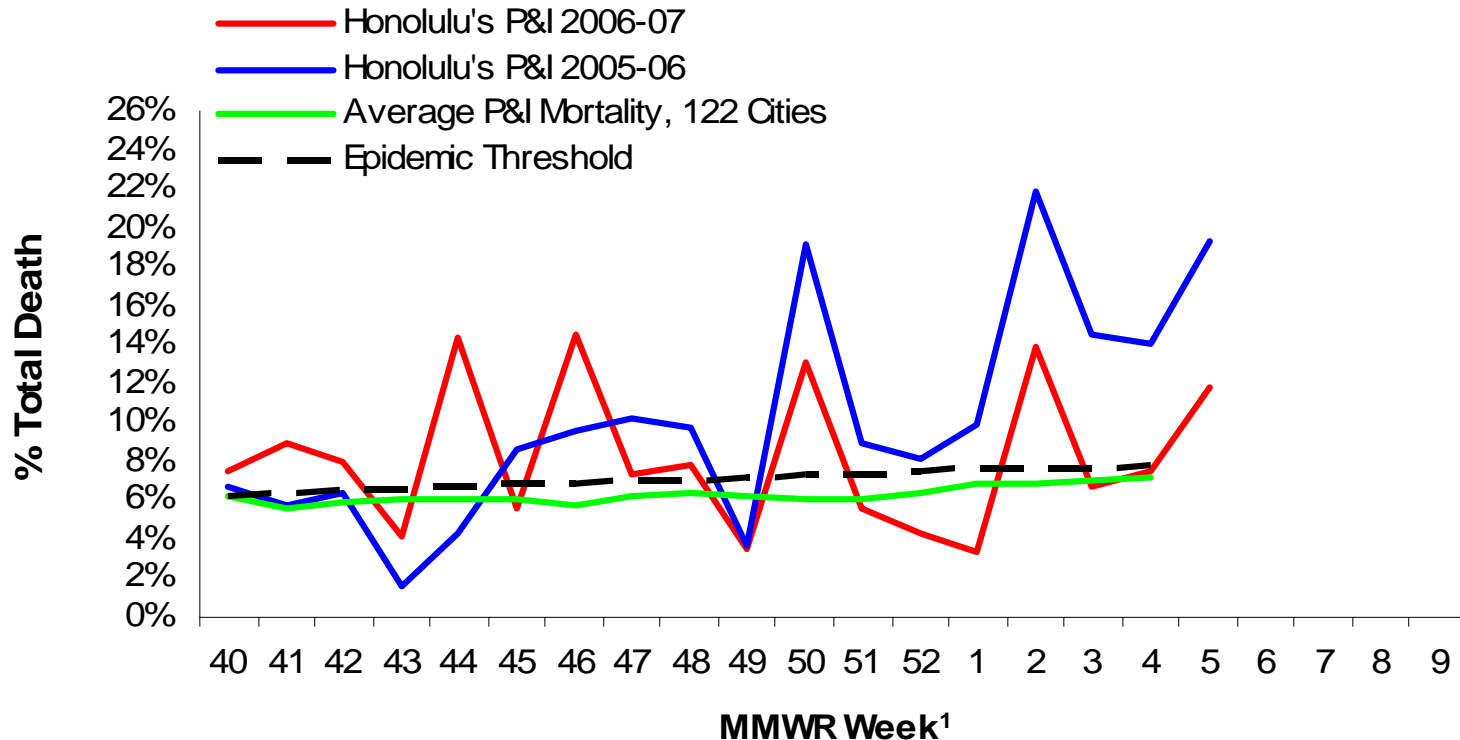


Hawaii Influenza Surveillance



Pneumonia & Influenza Mortality Surveillance

Pneumonia & Influenza (P&I) Related Mortality in Honolulu, 2006-2007



469 deaths during Flu Season 2005-06
111 deaths thus far during Flu Season 2006-07

Hawaii Influenza Surveillance

Enhanced targeted surveillance of unusual respiratory illness

Virology testing of routine specimens submitted by Hawaii Healthcare providers

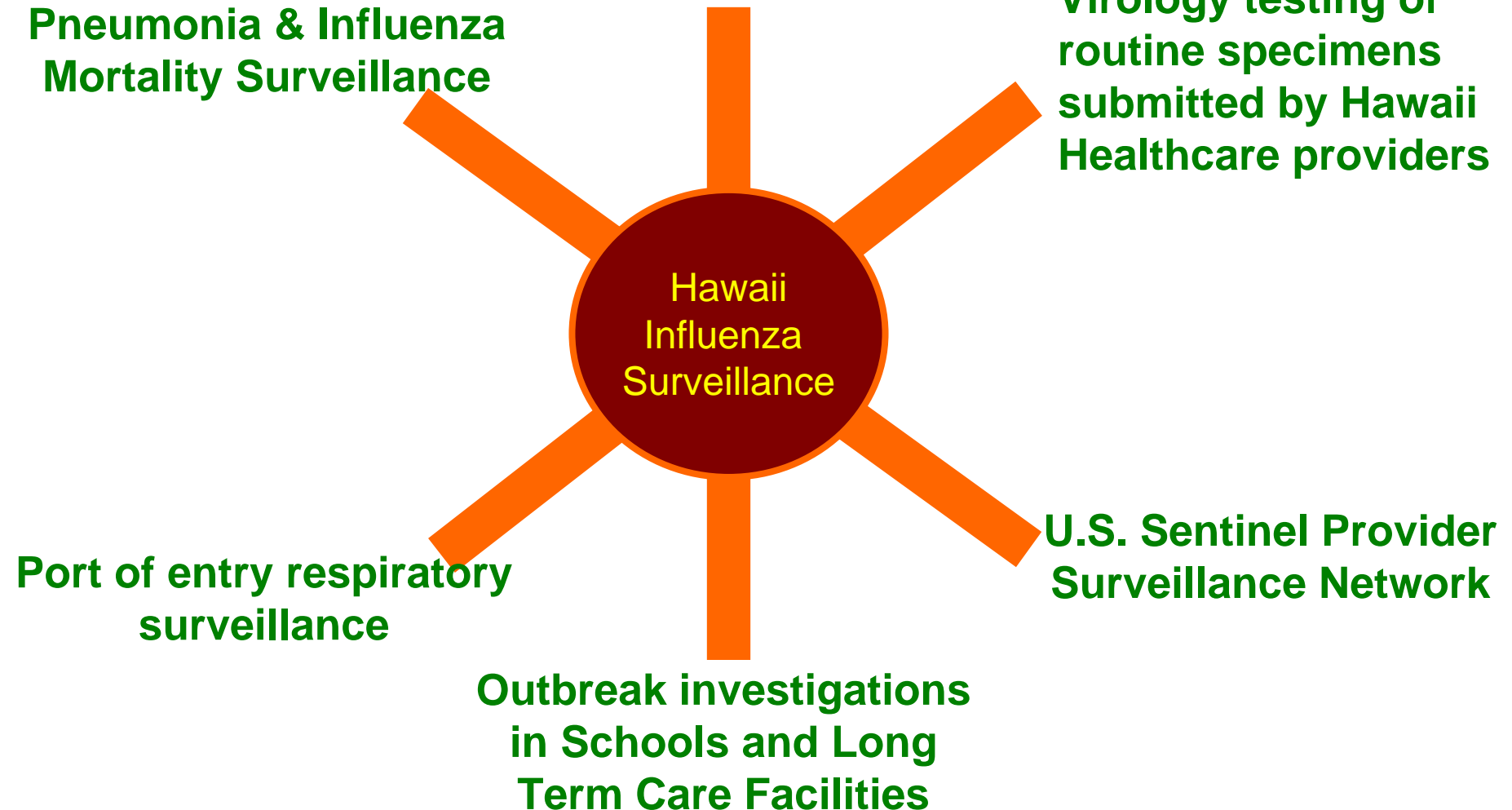
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Hawaii Influenza Surveillance

U.S. Sentinel Provider Surveillance Network

Port of entry respiratory surveillance

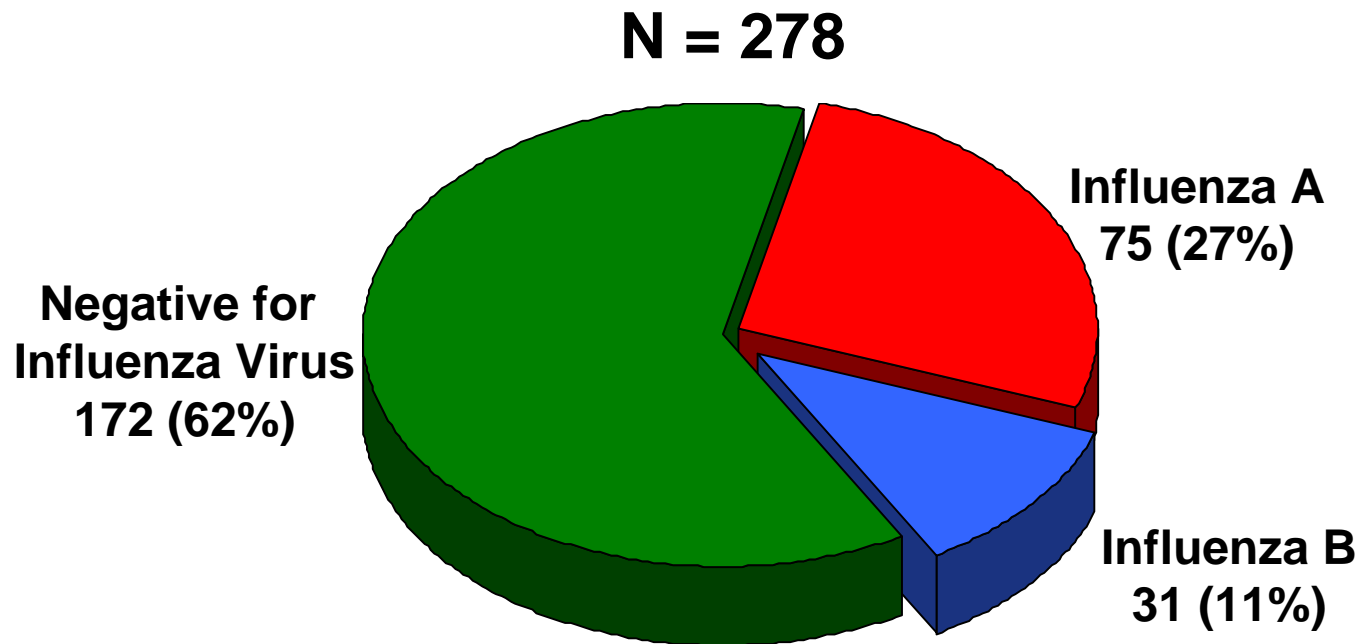
Outbreak investigations in Schools and Long Term Care Facilities



Enhanced targeted surveillance of unusual respiratory illness (RT-PCR TESTING)

November 1, 2005 – August 10, 2006

- Hospitalized patients with ARDS
- Hospitalized patients with X-ray confirmed pneumonia
- Patients with travel history outside the United States



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Hawaii Pandemic Influenza Preparedness & Response: Influenza Surveillance

Hawaii Population

1,275,194

Hawaii Pandemic Influenza Preparedness & Response: Influenza Surveillance

Hawaii Population

1,275,194

SEASONAL FLU:

5 - 20% get sick with the flu each year

159,399

12.5% of population

Specimens submitted during flu season

Specimens tested during flu season

7,491

5% of estimated sick

(max. capacity)

4,385

3% of estimated sick

Hawaii Pandemic Influenza Preparedness & Response: Influenza Surveillance

Hawaii Population

1,275,194

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(max. capacity)

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PANDEMIC FLU:

of projected illnesses

382,558

30% of population

Target testing 3-5% of sick patients

15,303(avg)

3% of estimated sick

Transition to Higher Throughput/ Faster Turnaround



Reliability

“Gold Standard”



**Preliminary result, but reliable
and accurate**

Transition to Higher Throughput/ Faster Turnaround



Reliability “Gold Standard”

Capacity 30/day

**Preliminary result, but reliable
and accurate**

Up to 600/day

Transition to Higher Throughput/ Faster Turnaround



Reliability “Gold Standard”

Capacity 30/day

Turnaround 2-3 weeks

**Preliminary result, but reliable
and accurate**

Up to 600/day

1-2 days

Transition to Higher Throughput/ Faster Turnaround



Reliability	“Gold Standard”
Capacity	30/day
Turnaround	2-3 weeks
Utility	Typing, sub-typing, strain-typing

Preliminary result, but reliable and accurate
Up to 600/day
1-2 days
Typing, sub-typing

Transition to Electronic Specimen Submission

PANDEMIC FLU:

of projected illnesses

382,558

30% of population

1,656 sick patients per day!

Transition to Electronic Specimen Submission

PANDEMIC FLU:

of projected illnesses

382,558

30% of population

1,656 sick patients per day!



Electronic Specimen Submission

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Mail

Address <https://www.providerportal.doh.hawaii.gov/> Go Links

Google Go Bookmarks AutoFill Send to Settings

Login

Hawaii Online Flu Submission Portal

[HDOH](#) | [eHawaii.gov](#) | [Aloha Alerts](#)

- [Hawaii Medical Library](#)
- [UH Medical Library](#)
- [Pub Med](#)
- [CDC's MMWR](#)
- [Emerging Infectious](#)



HAWAII STATE DEPARTMENT OF HEALTH
HEALTHY PEOPLE - HEALTHY COMMUNITIES - HEALTHY ISLANDS

Hawaii Online Influenza Specimen Submission Portal

Welcome to the Hawaii State Department of Health's online influenza specimen submission portal. Please login below with your username and password to submit specimens for influenza testing to the Hawaii Department of Health and to check your results.

If this is the first time you are accessing your account, please sign up below!

Forgotten your login or password? Please contact the Hawaii Department of Health's Influenza Surveillance Program at 586-4586 or email us at flu_surveillance@doh.hawaii.gov for assistance.

Please login



Username:

Password:

Login

Is this your first time here?



for a free account!

- [Hawaii Influenza Surveillance](#)
- [Hawaii Pandemic Flu Preparedness](#)
- [CDC Seasonal Flu](#)
- [CDC Avian flu](#)
- [PandemicFlu.gov](#)
- [WHO Influenza Surveillance](#)

Homepage



HAWAII STATE DEPARTMENT OF HEALTH
HEALTHY PEOPLE - HEALTHY COMMUNITIES - HEALTHY ISLANDS

Welcome to the Hawaii State Department of Health's Online Influenza Submission System! NOTE: If this is your first time logging in, please go to the last section ([Update Physician Profile](#)) and verify that information in your profile is accurate! Mahalo!

I want to...

Submit influenza specimens:

Specimens

HDOH Disease Investigation Branch
Influenza Online Submission



Review your patient results:

My Results

HDOH Disease Investigation Branch
Influenza Online Submission



Update Physician Profile:

Physician Profile

Update some of your specimen collection and transport preferences so that you do not have to fill them out manually on the specimen submission form.



Physician Profile



HAWAII STATE DEPARTMENT OF HEALTH
HEALTHY PEOPLE - HEALTHY COMMUNITIES - HEALTHY ISLANDS

My Profile

*required fields in yellow (5)

Last Name *

First Name M.I.

Medical License Number

Practice Name

Address *

Address (Line 2)

City *

State Zip *numbers only, no dashes

Phone Number (numbers only, no dashes) *

Fax Number

Email Address * Current email needed to inform you of your results

Specialty

Alternate Specialty

Are you a Sentinel Physician?

if yes, Sentinel ID#

What type of Influenza Specimen do you usually collect?

Which Clinical Lab most frequently handles your specimens?

Update record

Close

Reset

[Logout](#)

[Back to portal function page](#)

[Main DOH website](#)

Submit Specimen



HAWAII STATE DEPARTMENT OF HEALTH
HEALTHY PEOPLE - HEALTHY COMMUNITIES - HEALTHY ISLANDS

Submit a new specimen for influenza testing:

Submit New Specimen

HDOH Disease Investigation Branch
Influenza Online Submission



Please **Print** your form to include with your specimen. State Laboratories **will NOT** test your specimen without the accompanying form. Click on the appropriate **Submission #** and print the form.

SUBMISSION #	PATIENT ID	LAST NAME	FIRST NAME	BIRTH DATE	SEX	COLLECTION DATE
378		Test	Patient	12/12/1950	F	02/07/2007



[Logout](#) [Back to portal function page](#) [Main DOH website](#)



Submission Form

Submit a specimen for influenza testing

***You will be automatically logged out if no activity is registered for 20 minutes. Please complete your submission in one session if possible.**

Aloha Dr. Paul Effler!

I. Patient Identification

In House Patient ID# (if available)

Last Name*

Date of Birth* mm/dd/yyyy

Address

Zip esp. 96817-3083

II. Clinical Information

Date of illness* mm/dd/yyyy

Fever If yes, Temp (*F)

Cough

Muscle Aches

Other Symptoms

III. Prioritization Information

Patient Admitted to Hospital?

Patient Experiencing Acute Respiratory Distress (ARDS)?

Patient clinically diagnosed with pneumonia?

Travel outside Hawaii within 10 days prior to onset of symptoms?

Comments

IV. Specimen Information

Collection Date* mm/dd/yyyy

Lab

***Please review all information before submitting, Mahalo!**

Submit Specimen

***Submit specimen first before printing**

Print Submission Form

*required fields in yellow (S)

First Name* Middle Initial

Sex Resident?

City State

Sore throat Malaise Chills

Diarrhea Vomiting Headache

If yes, admission date mm/dd/yyyy

If yes, X-ray confirmed?

If yes, US Mainland

Country

* Ctrl key to multi-select / deselect

Reset Form



Medical Microbiology Branch
Hawaii State Department of Health
2725 Waimano Home Road
Pearl City, Hawaii 96782

Date Received by State Lab:

State Dept. of Health Accession #:

SPECIMENS COLLECTED FOR INFLUENZA SURVEILLANCE
CLINICAL DIAGNOSIS: INFLUENZA LIKE ILLNESS

PHYSICIAN: **Dr. Effler**
BUSINESS NAME: **Dr. Paul Effler**

SPECIMEN PRIORITY IDENTIFICATION:

SENTINEL PHYSICIAN ID#
PATIENT HOSPITALIZED? **Y** if yes, DATE
ARDS OF UNKNOWN ETIOLOGY? **Yes**
PATIENT CLINICALLY DIAGNOSED WITH PNEUMONIA?
XRAY CONFIRMED PNEUMONIA? **No**
TRAVEL OUTSIDE HAWAII WITHIN 10 DAYS PRIOR TO ONSET?
Yes
if yes, US Mainland State:
International: **Cambodia**

PATIENT IDENTIFICATION:

PATIENT ID#
LASTNAME: **Test** FIRST: **Patient**
DATE OF BIRTH: **12/12/1950** AGE: SEX: **F**
ADDRESS: **1132 Bishop Street**
CITY: **Honolulu** STATE: **HAWAII** ZIP: **96814**
COMMENTS:

Print Form

SPECIMEN COLLECTION / TESTING INFORMATION:

COLLECTION DATE: **02/07/2007**
SPECIMEN SITE: **Nasopharyngeal Swab**
CLINICAL LAB HANDLING SPECIMEN: **Hawaii State Laboratory**
RAPID TESTING DATE:
RAPID TEST RESULTS:

CLINICAL SIGNS AND SYMPTOMS:

DATE OF ONSET: **02/07/2007**
FEVER: **Y** (MAXIMUM TEMPERATURE: **100** °F
COUGH: **Y** MUSCLE ACHES: **Y**
SORE THROAT: **N** DIARRHEA: **N**
MALAISE: **N** VOMITTING: **N**
CHILLS: **N** HEADACHE: **N**
OTHER SYMPTOMS:

SECTION BELOW FOR DEPARTMENT OF HEALTH USE

PCR RESULTS - PRESUMPTIVE:
PCR SUBTYPE (if applicable):
VIRAL CULTURE RESULTS:
VIRAL CULTURE SUBTYPE (if applicable):
VIRAL STRAIN:
REASON FOR REJECTION (if any):

VACCINATION HISTORY

DID PATIENT RECEIVE FLU VACCINE IN THE LAST 6 MONTHS: **Y**
DATE OF LAST VACCINATION: **12/06/2006**

SECTION BELOW FOR DEPARTMENT OF HEALTH USE

[Print Specimen](#)

[Return to Patient Submission](#)

[Return to Patient Results](#)

Review Results



Submission #	In-house Patient ID	Last Name	First Name	Date of Birth	Practice Name	Collection Date	Lab	Report Date	Rapid Flu Test	RT PCR RESULT	SUBTYPE (PCR)	Viral Culture	Subtype Culture	Strain
378		Test	Patient	12/12/1950	Dr. Paul Effler	02/07/2007	Hawaii State Laboratory		Negative	Positive A		Influenza A	H3	

Records 1 to 1 of 1

The above table reflects your flu submissions to the Hawaii State Department of Health.. Once laboratory testing is complete, results will be updated in the above table.

To print out your patient's Influenza Specimen Submission Form, click on the respective [Submission #](#). The form that pulls up will automatically populate with all results available at that time.

(the above records) to CSV file



[Logout](#) [Back to portal function page](#) [Main DOH website](#)

Specimen/Data Flow

**Specimen submitted online
by healthcare provider**

Specimen/Data Flow

Specimen submitted online
by healthcare provider

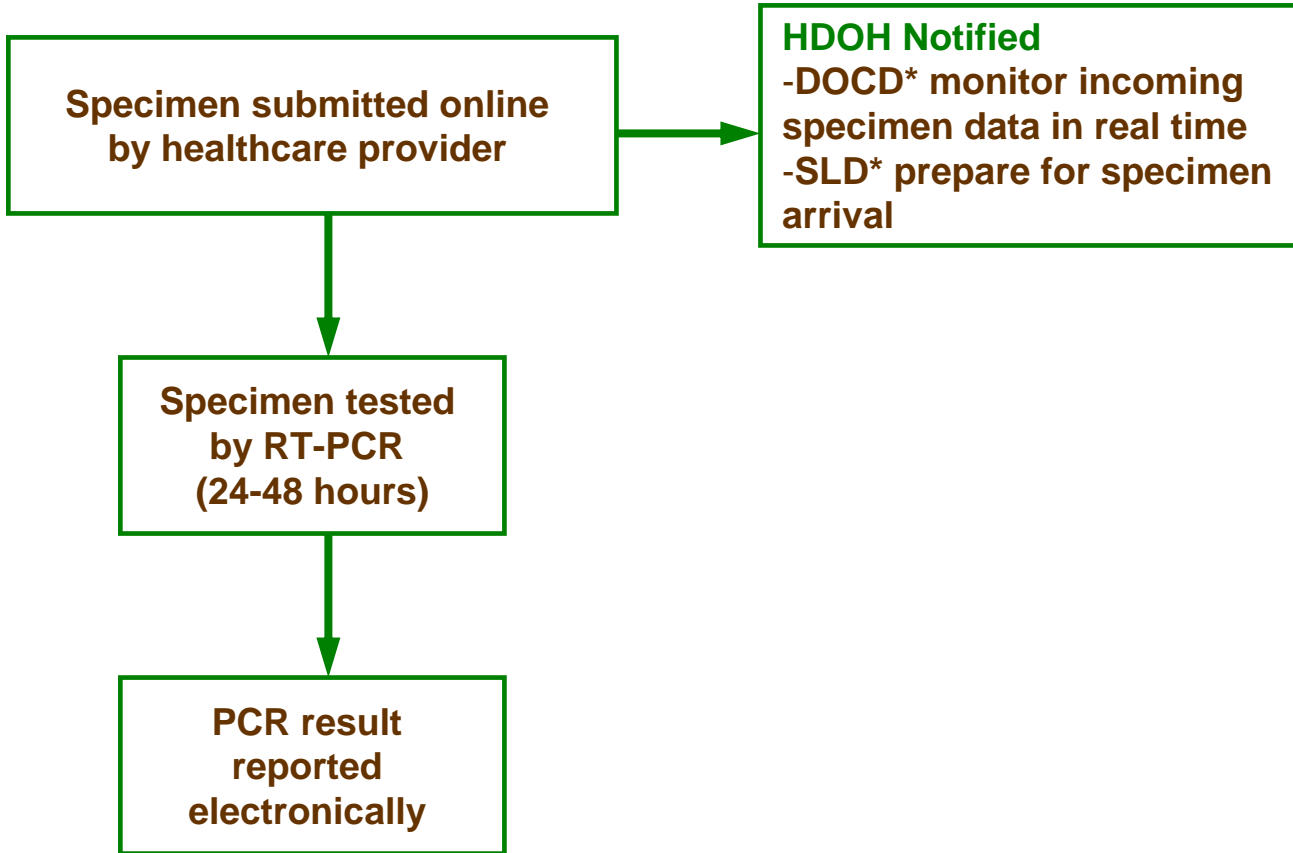
HDOH Notified

-DOCD* monitor incoming
specimen data in real time
-SLD* prepare for specimen
arrival

Specimen tested
by RT-PCR
(24-48 hours)

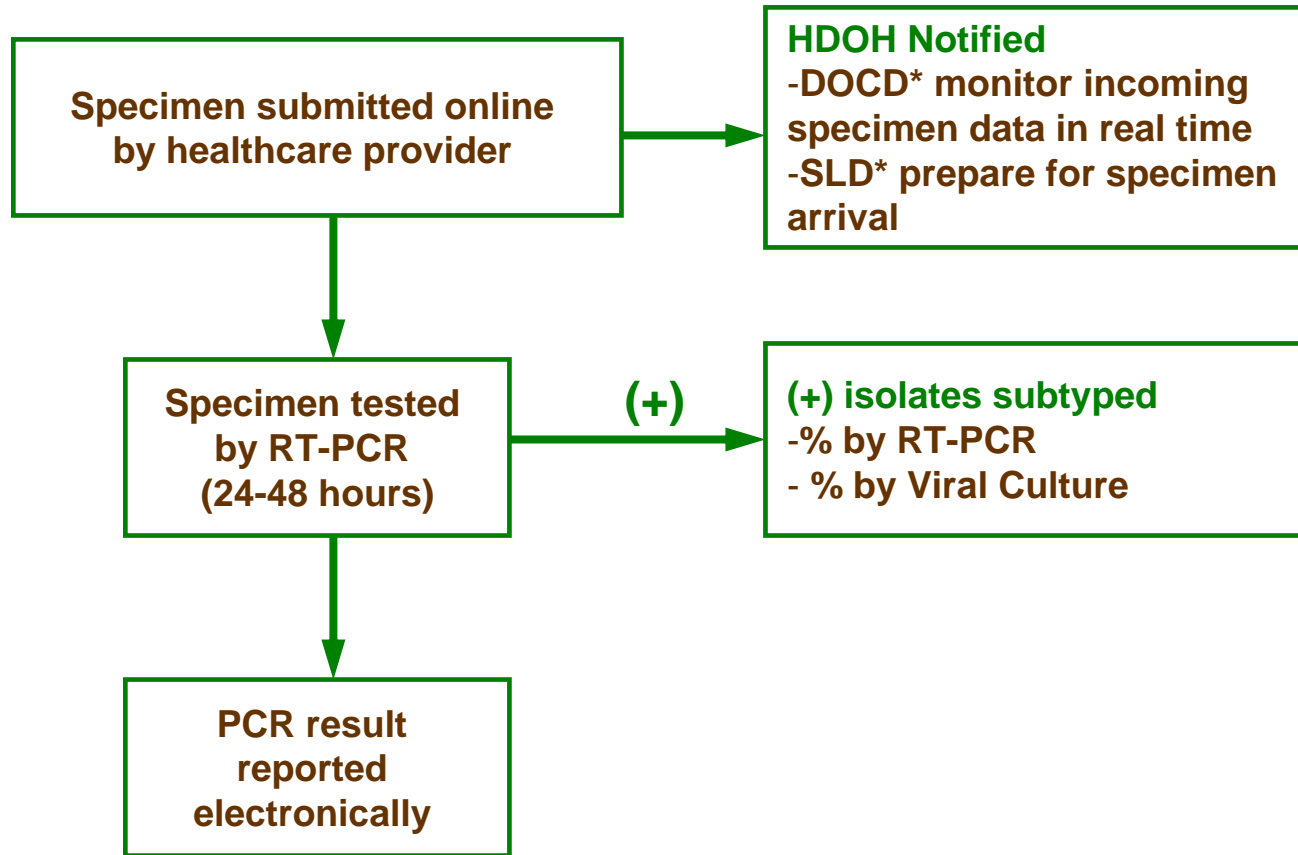
* DOCD: Disease Outbreak Control Division, SLD: State Laboratories Division

Specimen/Data Flow



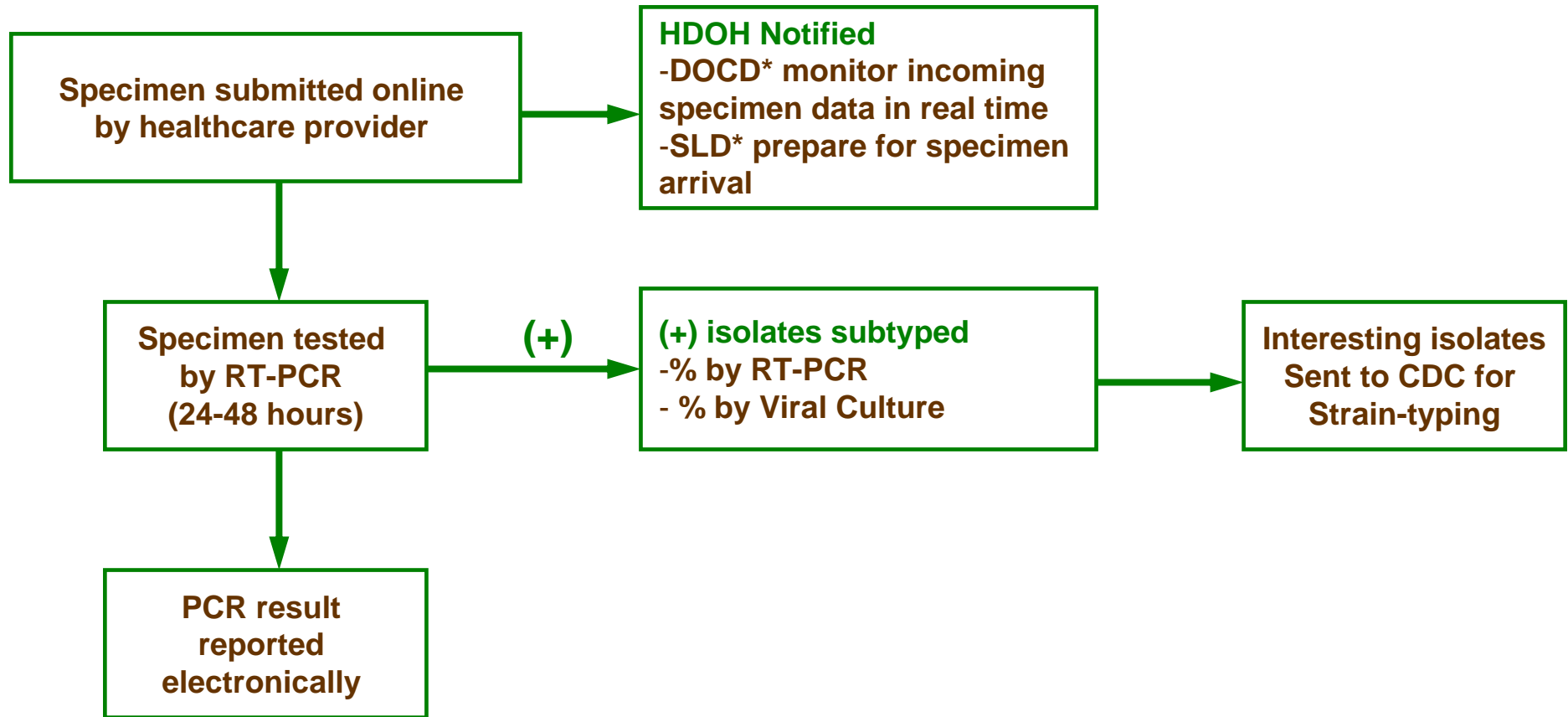
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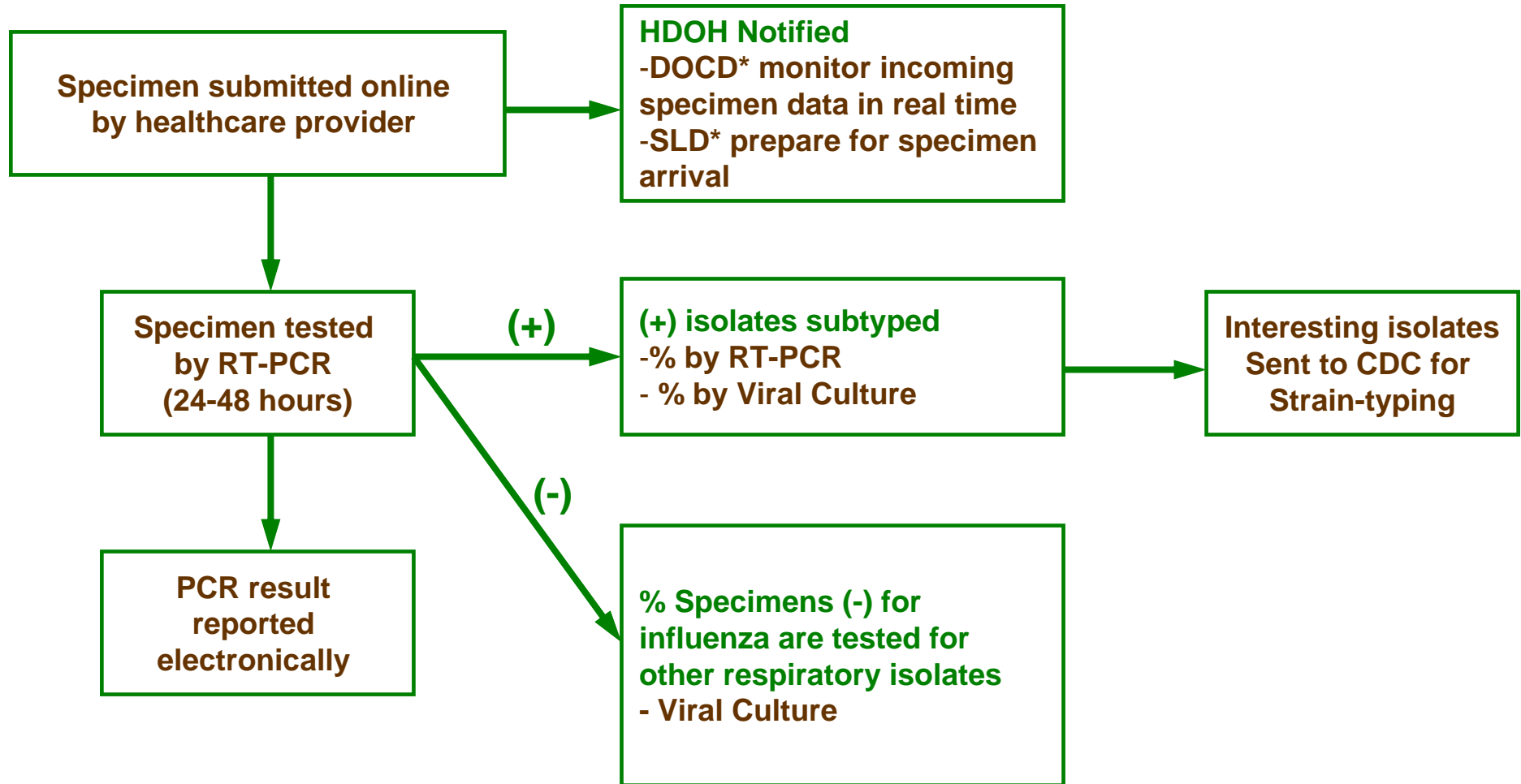
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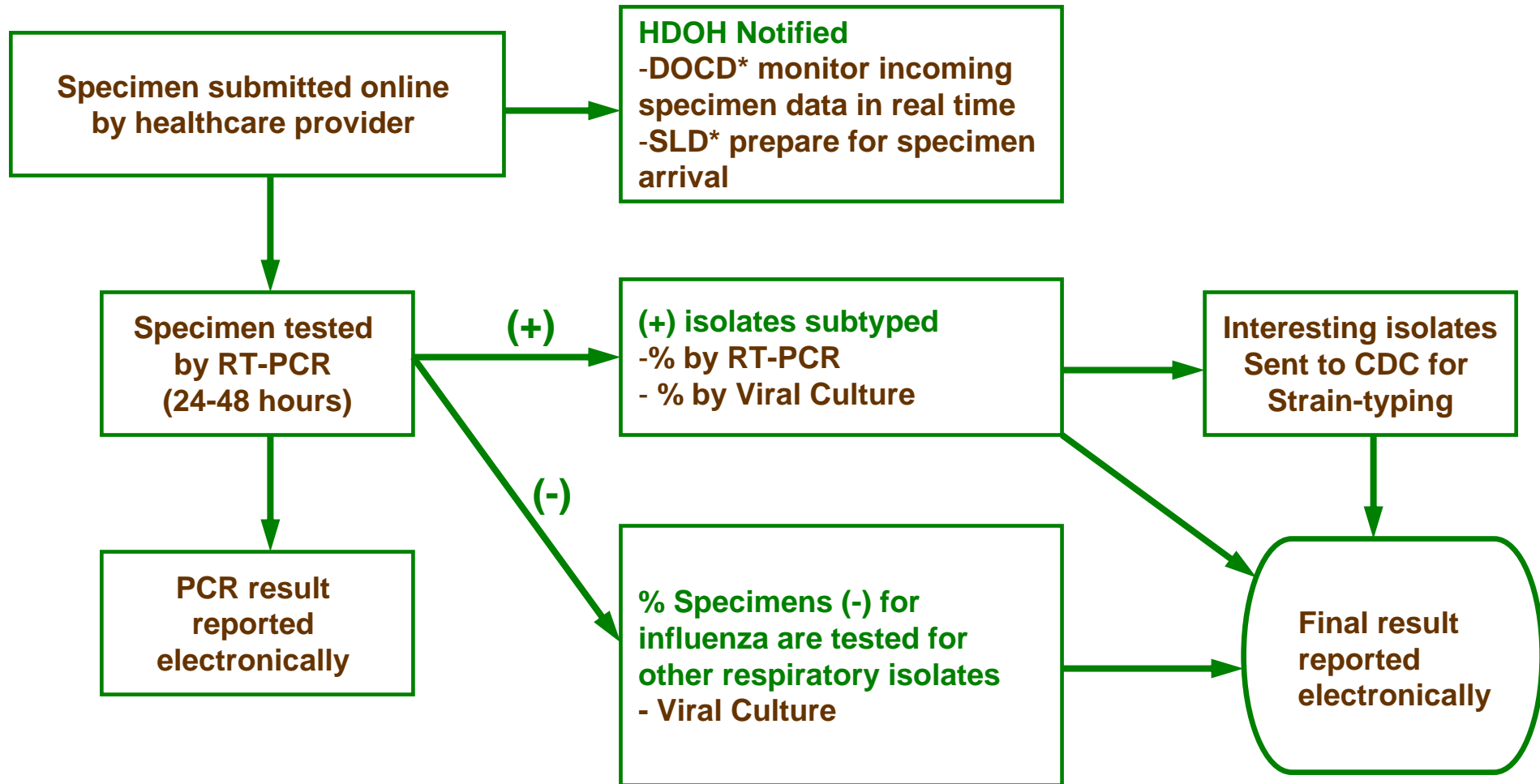
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Specimen/Data Flow



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Specimen/Data Flow



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Sources of Information

- Questions for Hawaii Dept of Health fluinfo@doh.hawaii.gov
- Hawaii Dept of Health
<http://www.hawaii.gov/health/family-child-health/contagious-disease/communications/pandemicflu.html>

<http://www.hawaii.gov/health/family-child-health/contagious-disease/influenza/index.htm>
- Centers for Disease Control & Prevention:
<http://www.cdc.gov/flu/pandemic/>
- US government
<http://www.pandemicflu.gov/>
- World Health Organization
<http://www.who.int/topics/influenza/en/>