Pandemic Influenza A (H1N1)
The Caribbean Experience
&
Lessons Learned

DETECTION AND SURVEILLANCE

James G. Dobbins Eldonna Boisson
Beryl Irons Ann George Rosalba Salas

CAREC

Bridgetown, Barbados
09/09/09

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We were looking for H5N1;

but we found H1N1;

So what?

What have we learned?

Note Bene: I think that in general surveillance for H1N1 in the Caribbean functioned and is still functioning extremely well, but still, there are lessons to be learned

Lesson Learned #1

- You will run out of supplies during a pandemic

- Anticipate this and be prepared for it
- Don’t panic… there is a way around everything

MMWR
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr

MMWR Dispatch
Vol. 58 / April 21, 2009

Swine Influenza A (H1N1) Infection in Two Children — Southern California, March–April 2009

On April 17, 2009, CDC determined that two cases of febrile respiratory illness occurring in children who resided in adjacent counties in southern California were caused by infection with a swine influenza A (H1N1) virus. The viruses from the two cases are closely related genetically, resistant to amantadine and rimantadine, and contain a unique combination of gene segments that previously has not been reported among swine or human influenza viruses in the United States or elsewhere. Neither child had contact with pigs; the source of the infection is unknown. Investigations to identify the source of infection and to determine whether additional persons have been ill from infection with similar swine influenza viruses are ongoing. This report briefly describes the two cases and the investigations currently under way. Although this is not a new subtype of

outpatient clinic, and a nasopharyngeal swab was collected for testing as part of a clinical study. The boy received symptomatic treatment, and all his symptoms resolved uneventfully within approximately 1 week. The child had not received influenza vaccine during this influenza season. Initial testing at the clinic using an investigational diagnostic device identified an influenza A virus, but the test was negative for human influenza subtypes H1N1, H3N2, and H5N1. The San Diego County Health Department was notified, and per protocol, the specimen was sent for further confirmatory testing to reference laboratories, where the sample was verified to be an unsubtypable influenza A strain. On April 14, 2009, CDC received clinical specimens and determined that the virus was swine influenza A (H1N1). The boy and his family reported that the child

Components of Laboratory-Based Surveillance

- Strategies for surveillance
- Case definition
- Specimen collection
- Specimen transport
- Specimen testing
- Reporting of results

1. Strategies for Surveillance

- Varies by pandemic phase
  - both globally and locally
- Initially look for presence of virus
  - all SARI + sample of ARI
- Then looking for epidemic pattern
  - all specimens from everywhere
- Then looking for changes in pattern and in the virus
  - all SARI + sample of ARI from new areas

Lesson Learned #2

- The sampling strategy will change during the course of a pandemic

- Be ready for it!

2. Case Definition

- Based on SARI and ARI definition
  - fever ≥ 38°C
  - presence of influenza-like symptoms
  - history of travel to infected area
- However, for PCR+ H1N1 cases selected on flu-like symptoms:
  - less than half had elevated temperatures


OCEAN DREAM

Ocean Dream

- Of 26 crew members ill with laboratory-confirmed influenza H1N1,
  - only one third had elevated temperatures
  - ALL reported the symptom of “feverish”

Lesson Learned #3

- Be certain that the case definition keeps up with our understanding of the illness

Moral of the story:

You will find whatever
you are looking for

3. Specimen Collection

- Aimed towards nasopharyngeal swabs
  - increasing evidence that throat or buccal swabs are just as effective for detecting H1N1 virus
- Specimen collection supplies need to be in the wards, not in the national epidemiologist's office
  - *[no further comment…]*

Lesson Learned #4

- Be certain that the type of sampling is based on the current illness rather than the previous one

4. Specimen Transportation

- System was set up for mostly local testing and then referral of positive specimens to CAREC, CDC, or European labs

- A special pre-paid contract was set up with DHL to handle all specimen transportation in the Caribbean

Specimen Transportation - 2

- One week into the pandemic DHL cancelled the contract
- Forced to use a variety of carriers including FEDEX, LIAT, and Caribbean Airlines
- For some countries there have also been significant delays within the country

Lesson Learned #5

- Don’t rely on just one carrier…try to spread the load and spread the risk

5. Specimen Testing

- Rapid test kits for antigen detection
- Immunoflorescence Assay (IFA)
- Real-time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)
- Viral culture

Rapid Test Kits

- Thought to have too low a sensitivity
- WHO downplayed there usefulness for H5N1 testing
- Performed much better than expected with H1N1 specimens
- Became the front-line test for many countries *(if they could get them)*

IFA

- Set up as the backbone of our influenza surveillance system
- Capacity established in most large and medium size countries
- Performed extremely poorly
  - we still lack the H1N1-specific reagents
  - very poor sensitivity for generic influenza A testing

PCR

- Was supposed to be the system for referral labs to confirm diagnoses
- Instead it became the front-line test for CAREC for most countries, which lead to:
  - Overwhelming demand for PCR testing
  - Shortage of primers and reagents
- Now expanding to 6-8 countries

Viral Culture

- This is the gold standard for surveillance
- We anticipated that culture would used extensively
- Completely stopped when BSL-3 conditions were required by WHO
- Now BSL-2 so we can begin again

Lesson Learned #6

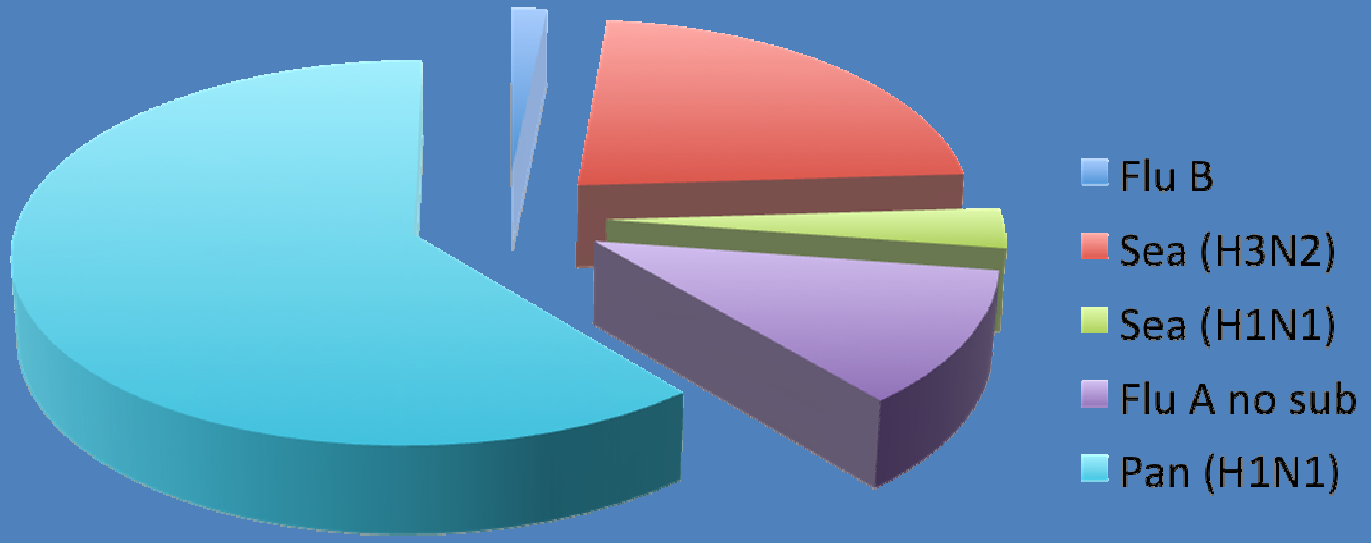
- Try to decentralize laboratory testing as much as possible
- Establish PCR capacity in more countries
- Anticipate that Murphy's Law will be in effect

6. Reporting of Results

- WHO, PAHO, and CDC all set up daily and then weekly reporting

- This information was always made available to all countries and to the general public

Influenza Subtypes Isolated in Week 34, 26 Countries from North and South



Based on 6,329 positive specimens

Flunet data reported by WHO 04 Sept 2009

CAREC Functional Response

- Formation of an Influenza Task Force
- Creation of a 24-hour Situation Room for communication and coordination with countries
- Establishment of 2 emergency telephone lines
- Publication of daily and weekly situation reports

CSR-FLU

CAREC SURVEILLANCE REPORT - INFLUENZA

Volume 1
Number 10
September 4, 2009
ISSN 2075-0854

Report on Influenza and Respiratory Illness in CAREC Member Countries
January 4 - September 2, 2009

Table 1: Laboratory Confirmed Aetiologic Agents
CAREC Member Countries
January 4 - September 2, 2009

		Cases (Percentage of total specimens tested)					
Country	Total Specimens Tested‡	Pandemic (H1N1) influenza	Seasonal Influenza A H1N1	Seasonal Influenza A H3N2	Influenza B	Parainfluenza Type 1, 2, 3	Adenovirus
Anguilla	17	1 (5.9%)		2 (11.8%)			
Antigua & Barbuda	18	4 (22.2%)		1 (5.6%)			
Aruba[a]	406	57 (14.0%)					
Bahamas	48	23 (47.9%)		1 (2.1%)			
Barbados	239	68 (28.5%)		3 (1.3%)	15 (6.3%)	4 (1.7%)	2 (0.8%)
Belize	120	28 (23.3%)		1 (0.8%)	2 (1.7%)	2 (1.7%)	2 (1.7%)
Bermuda	30	9 (30.0%)		1 (3.3%)			
British Virgin Islands	35	13 (37.1%)					
Cayman Islands[b]	244	101 (41.4%)	10 (4.1%)	9 (3.7%)	4 (1.6%)	1 (0.4%)	
Dominica	32	2 (6.3%)				2 (6.3%)	
Grenada	30	3 (10.0%)		1 (3.3%)			
Guyana	74	12 (16.2%)					
Jamaica[c]	-	80 (-)	9 (-)	7 (-)	12 (-)		
Montserrat	8	0 (0.0%)					
Netherlands Antilles[d]	202	101 (50.0%)					
St. Kitts & Nevis	24	6 (25.0%)					
St. Lucia	85	12 (14.1%)					
St. Vincent & Grenadines	19	2 (10.5%)					
Suriname	252	41 (16.3%)	6 (2.4%)	3 (1.2%)	4 (1.6%)		
Trinidad & Tobago[e]	470	115 (24.5%)		4 (0.9%)	9 (1.9%)	3 (0.6%)	
Turks & Caicos	91	35 (38.5%)			2 (2.2%)		
Total	**2444**	**713 (29.2%)**	**25 (1.0%)**	**33 (1.4%)**	**48 (2.0%)**	**12 (0.5%)**	**4 (0.2%)**

Notes:

- \- Data are not available
- ‡ This figure does not include rejected or contaminated specimens
- a Three specimens from Aruba tested positive for Influenza A but subtype is unknown
- b One specimen from the Cayman Islands tested positive for influenza A but subtype is unknown
- c Five specimens from Jamaica were mixed influenza specimens and four specimens tested positive for influenza A but subtype is unknown
- d Of the 101 Pandemic (H1N1) lab confirmed cases reported, 49 were from Curacao, 29 were from Bonaire, 22 were from St. Maarten and 1 was from St. Eustatius. Three of the cases from Curacao were from a cruise ship
- e One specimen from Trinidad and Tobago tested positive for influenza A but subtype is unknown

Table 2: Hospitalizations and Deaths for Laboratory Confirmed Cases of Pandemic (H1N1) 2009★
CAREC Member Countries
January 4 - September 2, 2009

Country#	Total Reported Hospitalizations	Total Reported Deaths
Anguilla	0	0
Antigua	0	0
Barbados	9	0
Belize	1	0
Cayman Islands	26	1
Dominica	0	0
Guyana	2	0
Jamaica	13	4
Netherlands Antilles	2	0
St. Kitts & Nevis	1	1
St. Lucia	2	0
Suriname	10	0
Turks and Caicos Islands	0	0
Total	**66**	**6**

Note:

★ Figures have been adjusted based on reports received from countries

Countries not included in this table have not reported hospitalizations data or deaths of laboratory confirmed Pandemic (H1N1) cases

Figure 2: Presenting Symptoms of Laboratory Confirmed Cases of Pandemic (H1N1) and of Seasonal Influenza A and B
April 16 - September 2, 2009
CAREC Member Countries

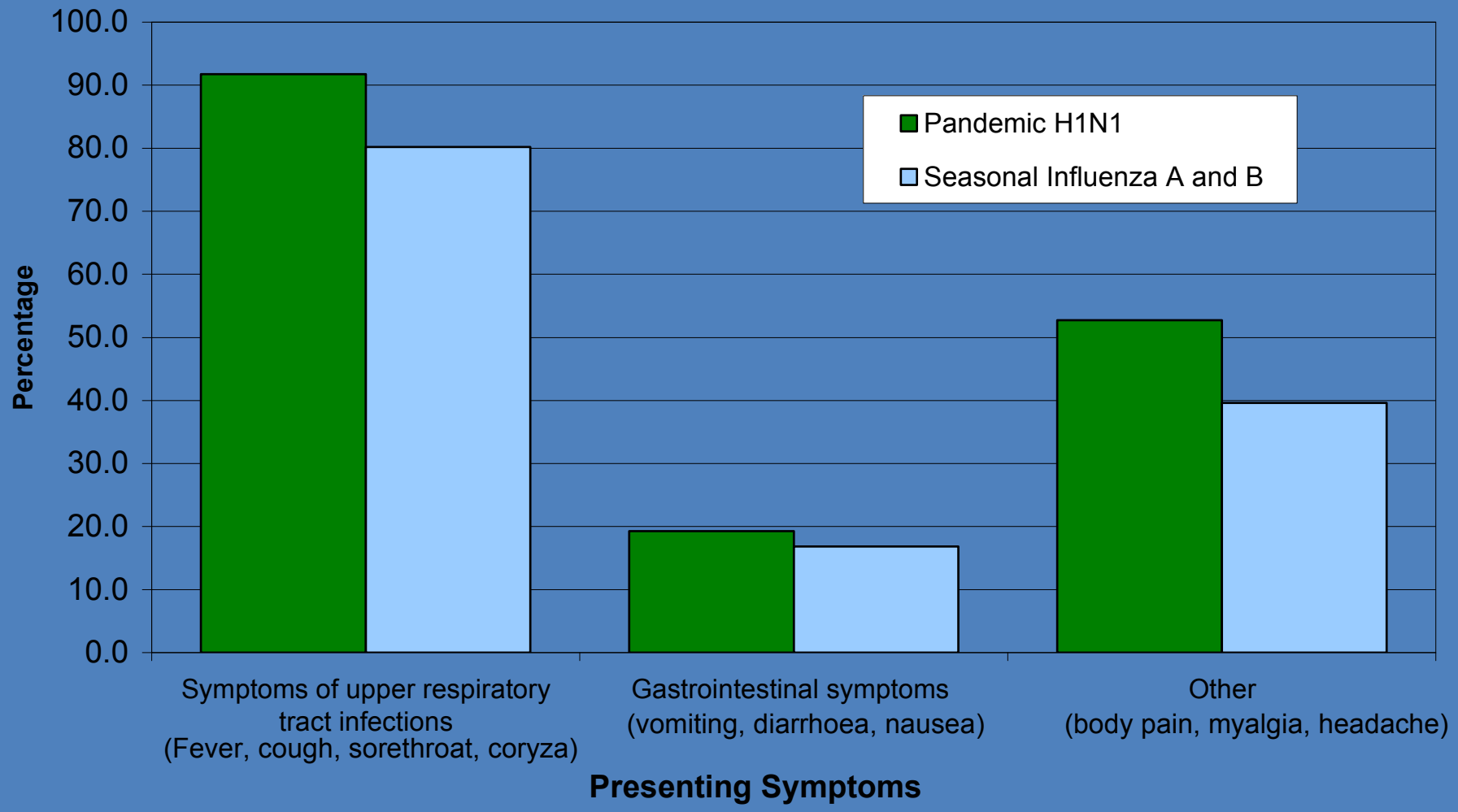


Figure 7: Total Acute Respiratory Infections
2007/2008 Average and 2009 Incidence rates per 100,000 Population
Reporting Period: Epidemiologic Weeks 1 - 34

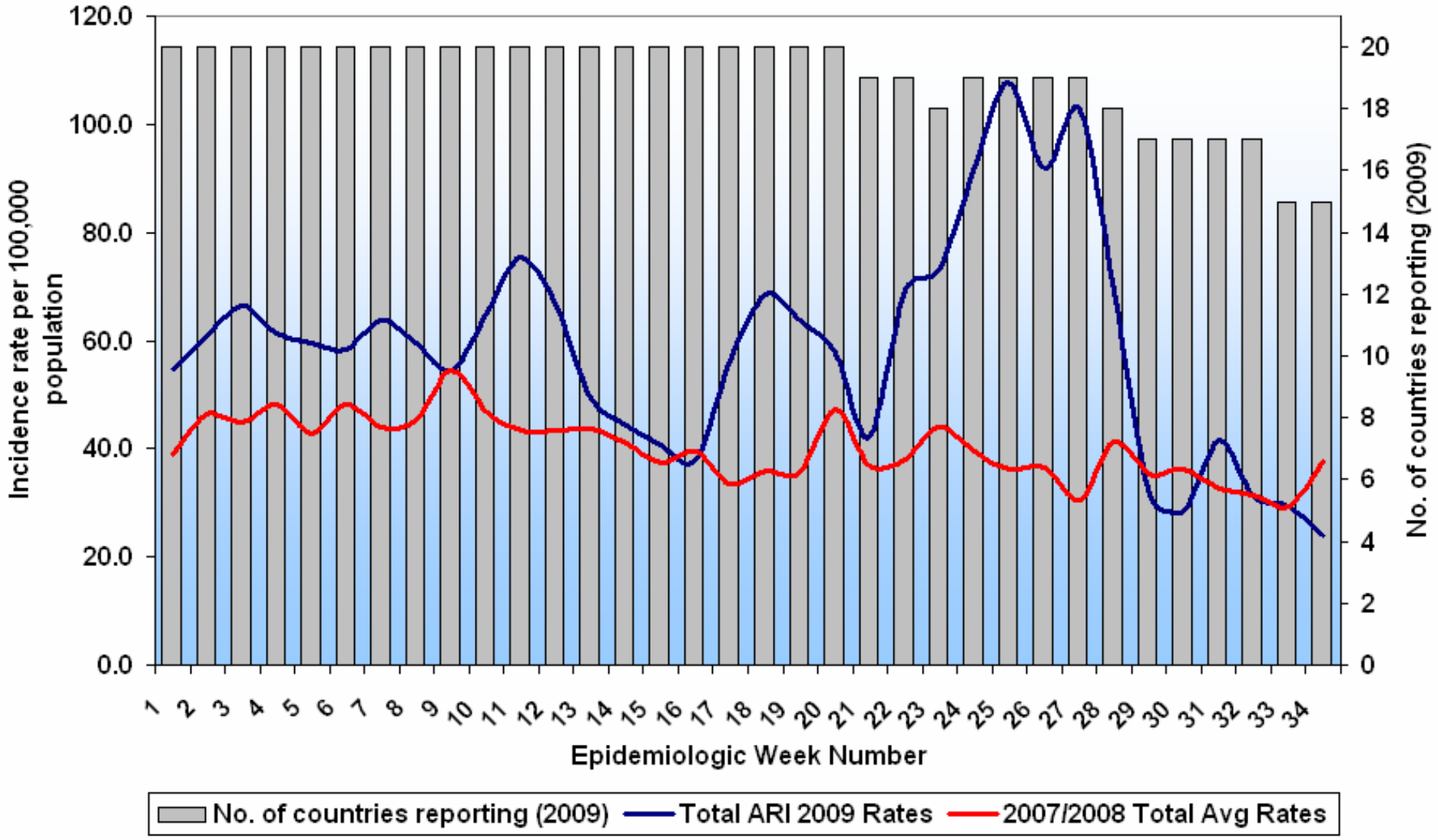


Figure 9: SARI Admissions Rate per 1,000 Medical Hospital Admissions
Barbados, Bahamas, Dominica, Jamaica, St. Vincent & the Grenadines, Suriname and Trinidad & Tobago
Epidemiologic Weeks 1 - 34, 2008 and 2009

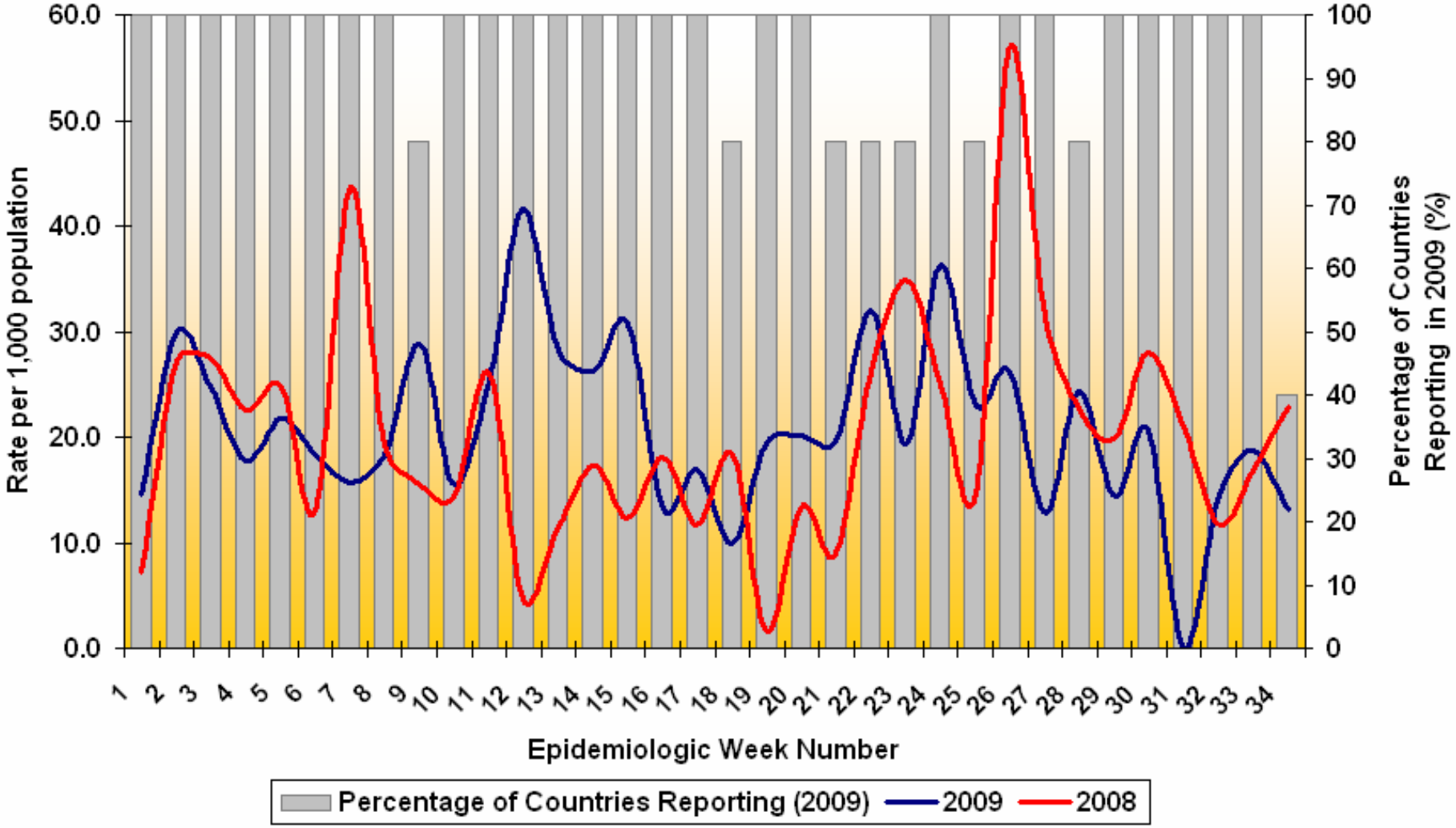
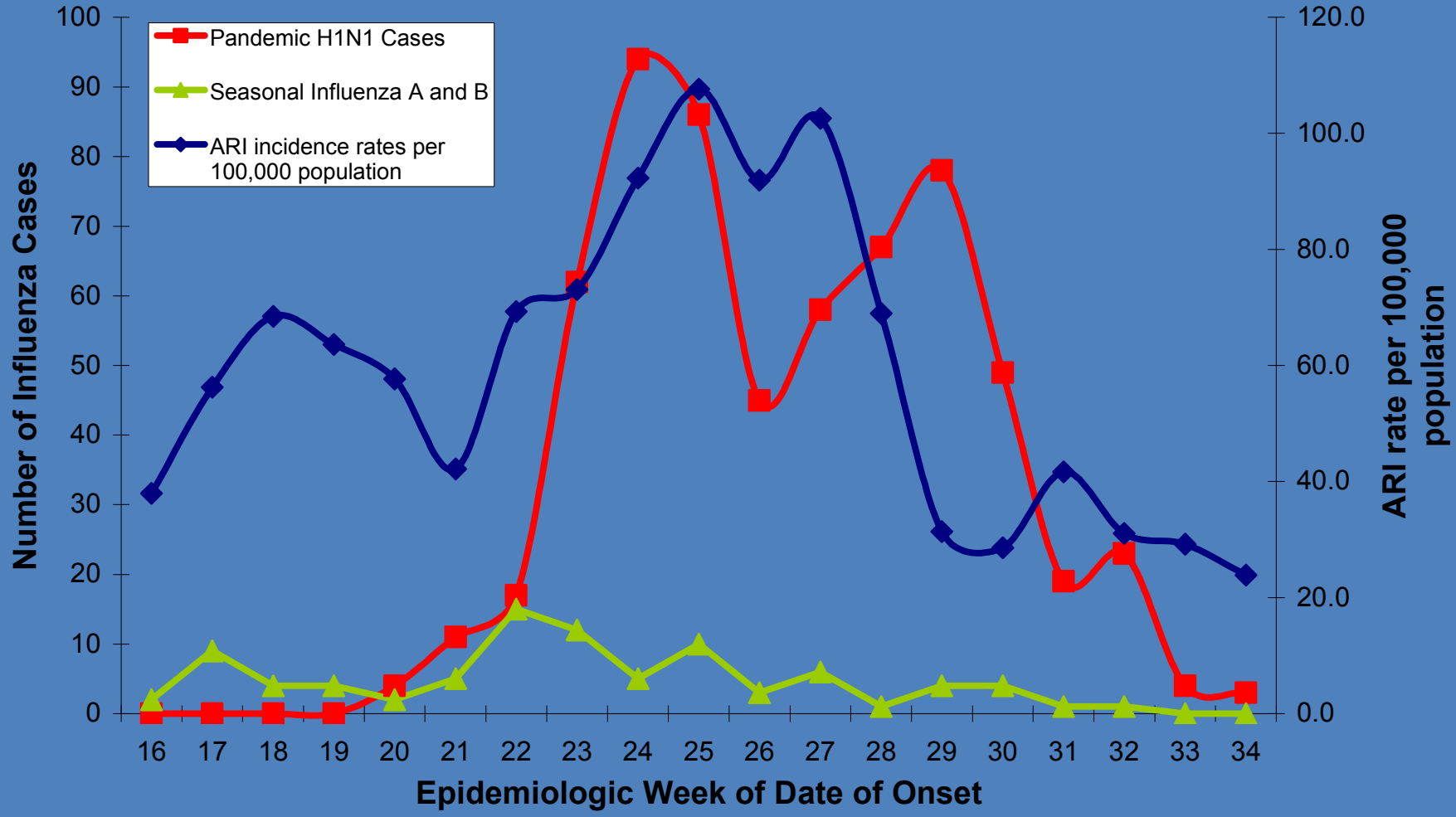


Figure 1: Laboratory Confirmed Pandemic (H1N1) Cases and Seasonal Influenza A and B and Acute Respiratory Infections Incidence rate per 100,000 Population April 16 - September 2, 2009, CAREC Member Countries



Lesson Learned #7

- We can see that many of our problems were caused by lack of knowledge

- The more information that can be assembled and released, the more chance of success we will have

A Final Lesson Learned: The Importance of Youth Sports

- Volleyball in T&T
- Little League in Puerto Rico
- Cancellation of Caribbean Games in T&T

That's All, Folks!