



U.S. Response to 2009 H1N1 Influenza

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GLOBAL CENTER
FOR HEALTH SECURITY

Lessons Learned...

(to apply to combating antimicrobial resistance, future pandemics, etc.)

1. Recognize you are always behind.
2. A plan must include goals, strategy, and anticipation.
3. Read your history – nothing is new.
4. Lead from the front.



Always Behind --H1N1 Emerges

- **April 12, 2009**
 - Mexico reports respiratory illness outbreak in Veracruz State to PAHO
- **April 15, 2009**
 - First human infection with new influenza A H1N1 virus detected in California.
- **April 17, 2009**
 - Second human infection with the new influenza A H1N1 virus detected in California...no known connection to previous patient.
 - Mexico reports respiratory illness/ILI outbreak in Oaxaca State
- **April 23, 2009**
 - Two additional human infections with 2009 H1N1 detected in Texas
 - Cases of ILI in Mexico confirmed as H1N1 to PAHO
- **April 25, 2009 (Saturday)**
 - World Health Organization (WHO) declares public health emergency of international concern.
- **April 30, 2009**
 - Us confirmed cases at 109, hundreds of schools closed with respiratory disease outbreaks

<https://www.cdc.gov/flu/pandemic-resources/2009-pandemic-timeline.html>

<https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5817a5.htm>



“We are driving while looking through the rear-view mirror.”

- Dr. Carter Mecher



Have a plan

“The essence of strategy is knowing what you’re trying to achieve.”

– Heidi Avery, Deputy Homeland Security Advisor

Overview of 2009-H1N1 Pandemic Response Planning

June 1, 2009

HSC – Biodefense Directorate

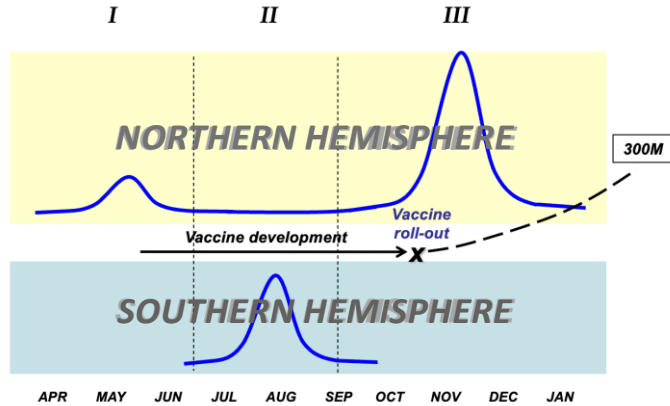
Protect the American People, by . . .

- Slowing the spread of a pandemic to the United States
- Limiting the domestic spread of a pandemic and mitigating disease, suffering and death
- Sustaining infrastructure and mitigating impact to the economy and the functioning of society

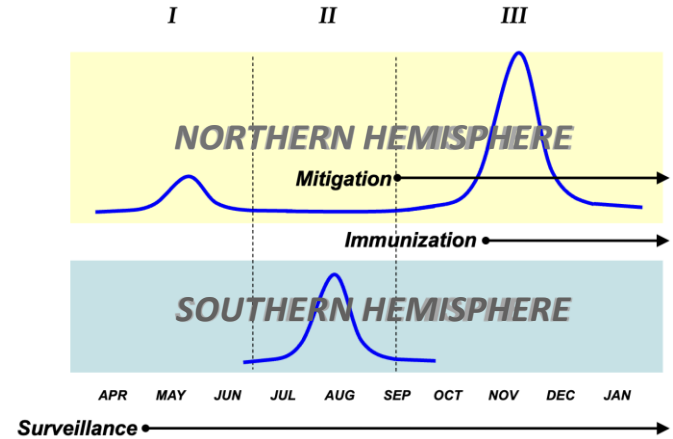


Anticipate

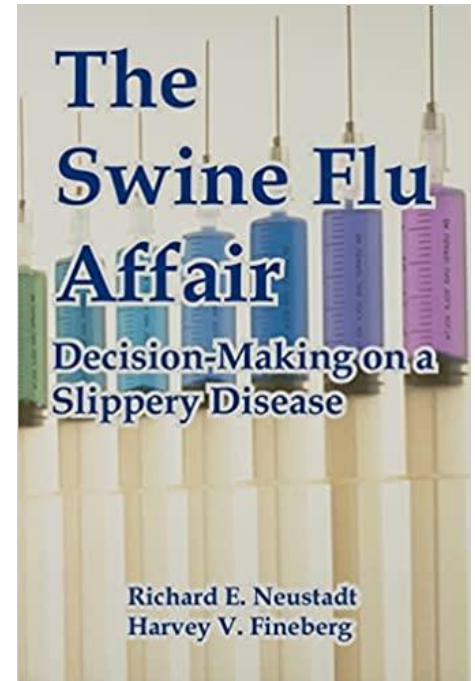
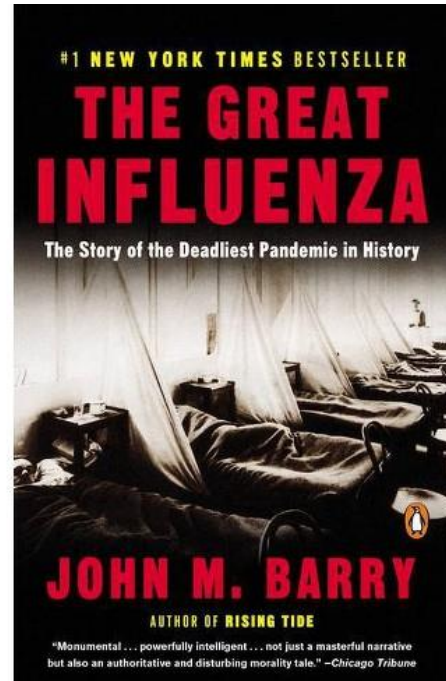
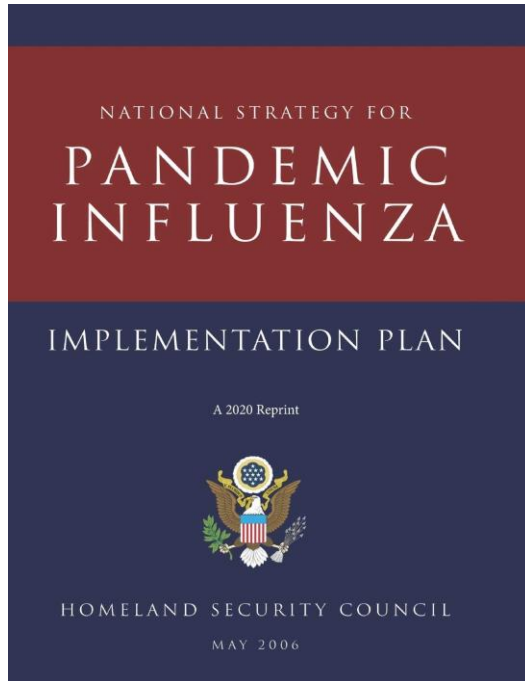
Pandemic Trajectory



Pandemic Trajectory

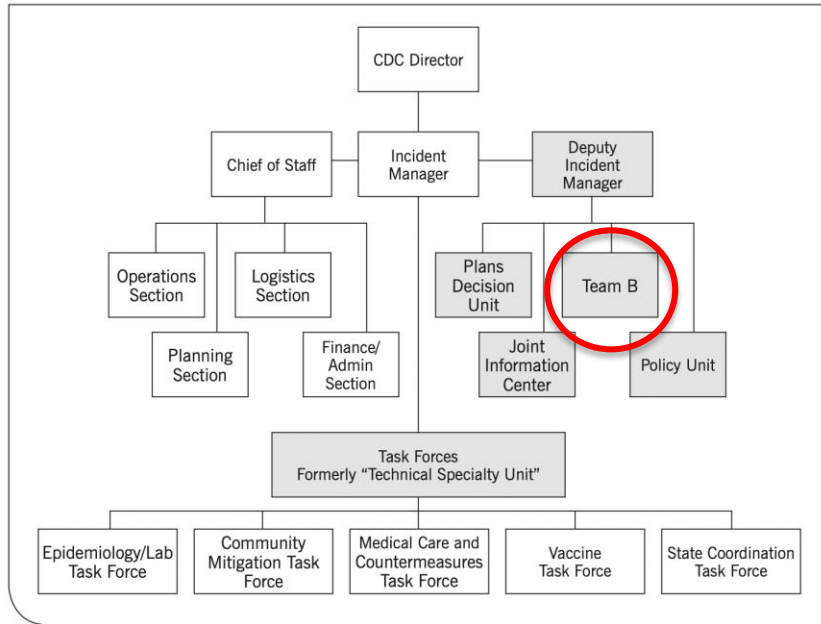


Read your history



CDC Team B

Figure 2: The CDC's Incident Management System (as of November 2009)



David Sencer
CDC Director, 1966-77



Bill Foege
CDC Director, 1977-83

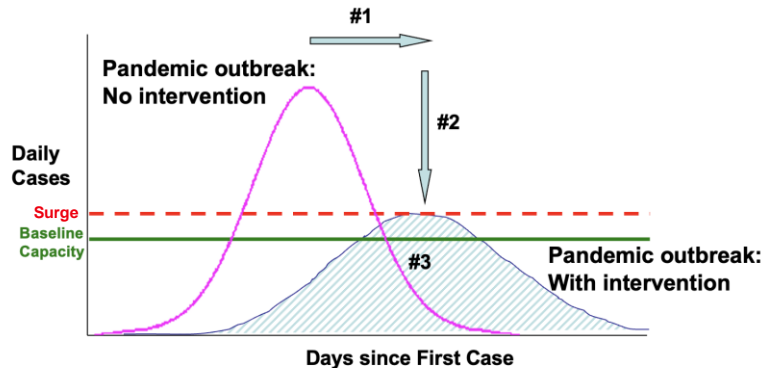
<https://www.businessofgovernment.org/sites/default/files/Adapting%20the%20Incident%20Command%20Model%20for%20Knowledge-Based%20Crises.pdf>



Nothing is new...

Reducing the Burden on Communities

1. Delay outbreak peak
2. Decompress peak burden
3. Diminish overall impacts



Fundamentals

- Vaccine
- Immunization
- Community Mitigation
- Antivirals
- Medical Capacity
- Critical Infrastructure and Key Resources
- Surveillance and Analytics



Post-game analysis

- Evolution of the H1N1 pandemic response
 - **Oct 5, 2009** -first doses of 2009 H1N1 influenza vaccine administered
 - **Late Oct 2009** -peak of national flu epidemic curve in US
 - **Early Dec 2009** -100M dose mark of 2009 H1N1 flu vaccine produced
 - **August 11, 2010** -WHO announces end of H1N1 pandemic
- 2009 H1N1 CDC estimates for US through April 10, 2010:
 - **60.8 million cases (20% community attack rate)**
 - **274,304 hospitalizations**
 - **12,469 deaths**
- Global death estimate: 151,700-575,400 during the first year the virus circulated.
 - **80 percent of (H1N1)pdm09 virus-related deaths occurred in people younger than 65 years of age.**
 - For typical seasonal influenza epidemics, 70 percent to 90 percent of deaths are estimated to occur in people 65 years and older.



A pandemic of the young...

Table 4. Comparing Impact: 2009 Pandemic Influenza A (pH1N1) vs Seasonal Influenza: Deaths and Hospitalizations per 100,000 by Age Groups

Age (years)	Numbers per 100,000 (ranges)			
	Deaths		Hospitalizations	
	Median pH1N1 ^a	Average 1990 to 1999 ^b	Median pH1N1 ^a	Average 1979 to 2001 ^c
0–17	1.7 (1.2–2.5)	8.5X 0.2 (.03–.4)	117.4 (83.5–172.4)	7.4X 15.8 (3.6–32.3)
18–64	5.0 (3.6–7.3)	12.5X 0.4 (.07–1.0)	83.8 (59.6–123.0)	4.0X 20.8 (4.8–42.4)
65+	4.2 (3.0–6.1)	22.1 (3.8–54.1)	70.1 (49.9–103.0)	282 (64.8–575.2)
All	4.1 (2.9–6.0)	3.1 (.5–7.6)	90.2 (64.2–132.4)	52.4 (12.1–107.0)

^a Median, minimum, and maximum calculated from the total estimates of deaths and hospitalizations, April 12, 2009–April 10, 2010 (cf Table 2). Rates calculated using estimates of US population as at July 1, 2008. 0–17 years, 74.6 million; 18–64 years, 190.5 million; 65+ years, 38.9 million. Source: Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000, to July 1, 2008 (NC-EST2008-01) US Census Bureau. Release Date: May 14, 2009. Available at <http://www.census.gov/popest/national/asrh/NC-EST2008-sa.html>.

^b Underlying pneumonia and influenza deaths, calculated from Table 5 in Thompson et al. 2003 (5). We estimated ranges based on the proportion of the minimum and maximum number of annual deaths to the mean number of deaths (Table 3, ref. [5]). The minimum was .17 of the mean, and the maximum was 2.45 of the mean. We used these proportions to estimate ranges about the mean number of deaths per 100,000 per age group.

^c Underlying pneumonia and influenza-related hospitalizations, where pneumonia or influenza was listed as, upon patient discharge, any cause of hospitalization. We estimated ranges based on the proportion of the minimum and maximum number of annual hospitalizations compared to the mean number of hospitalizations (Table 2, ref. [4]). We used these proportions to estimate ranges about the mean number of hospitalizations per 100,000 per age group.



White House H1N1 Pandemic Team



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Heidi Avery

Richard Hatchett, MD

Carter Mecher, MD

James Lawler, MD MPH





“We didn’t dodge a bullet. It’s just that nature shot us with a BB gun.”

Dr. Richard Hatchett