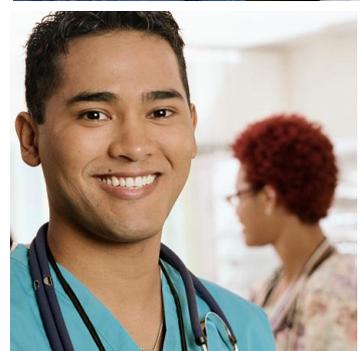
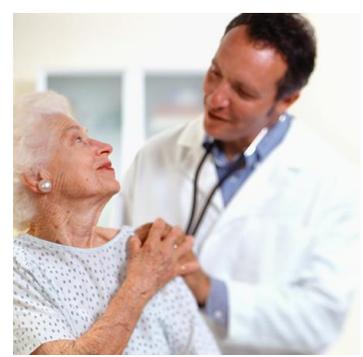


# Leadership For National Health Security



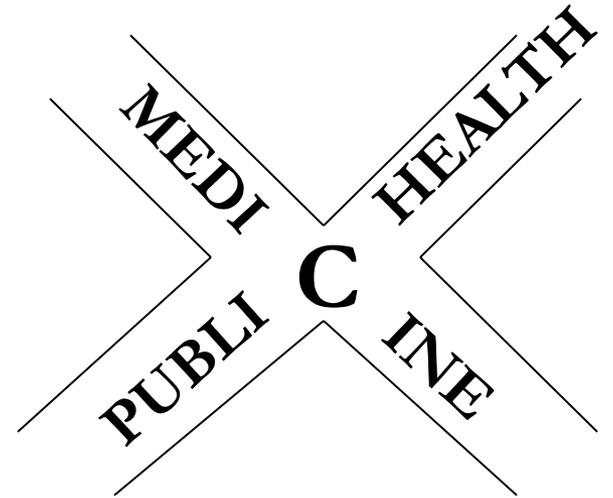
# HEALTH SECURITY

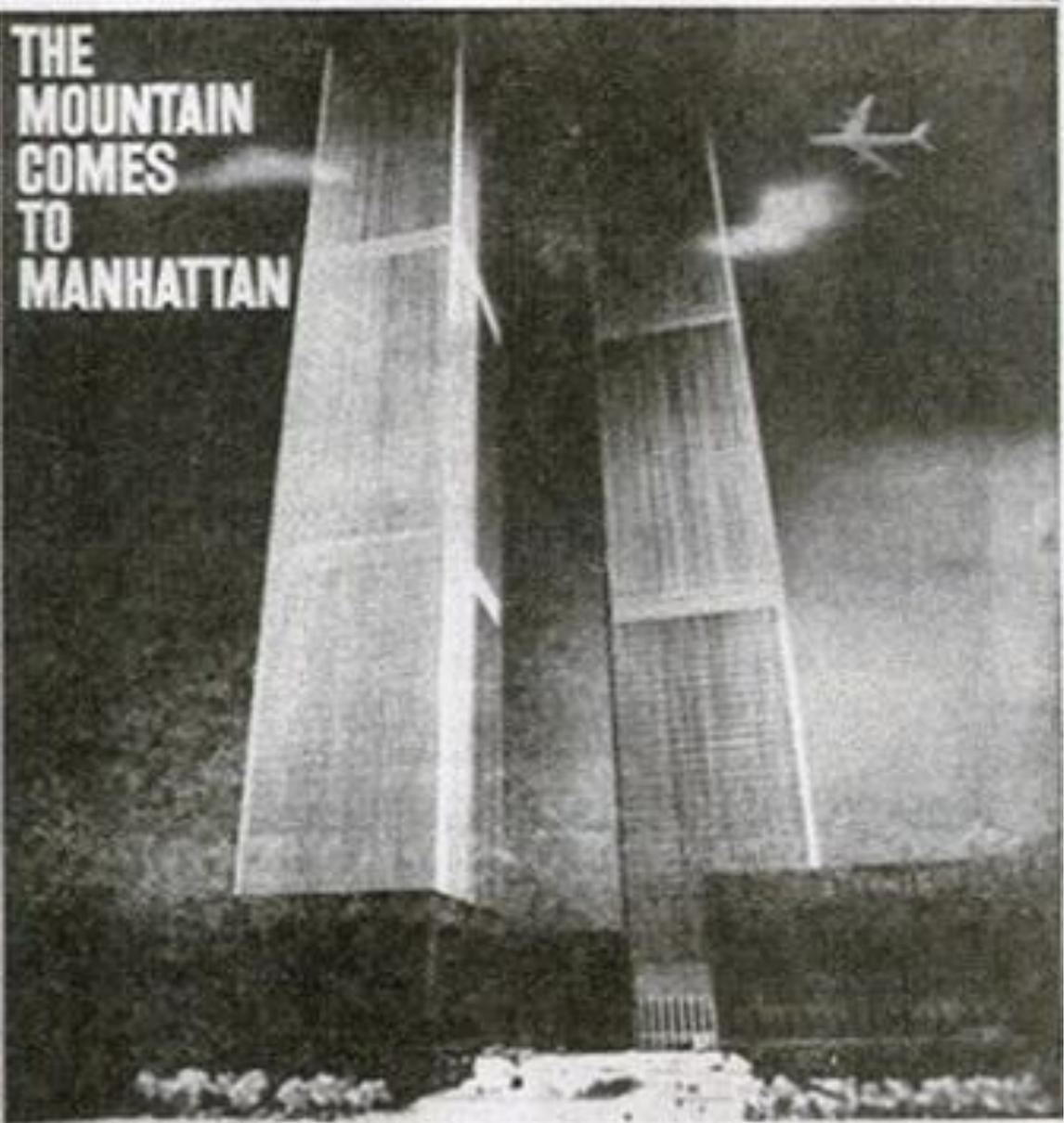


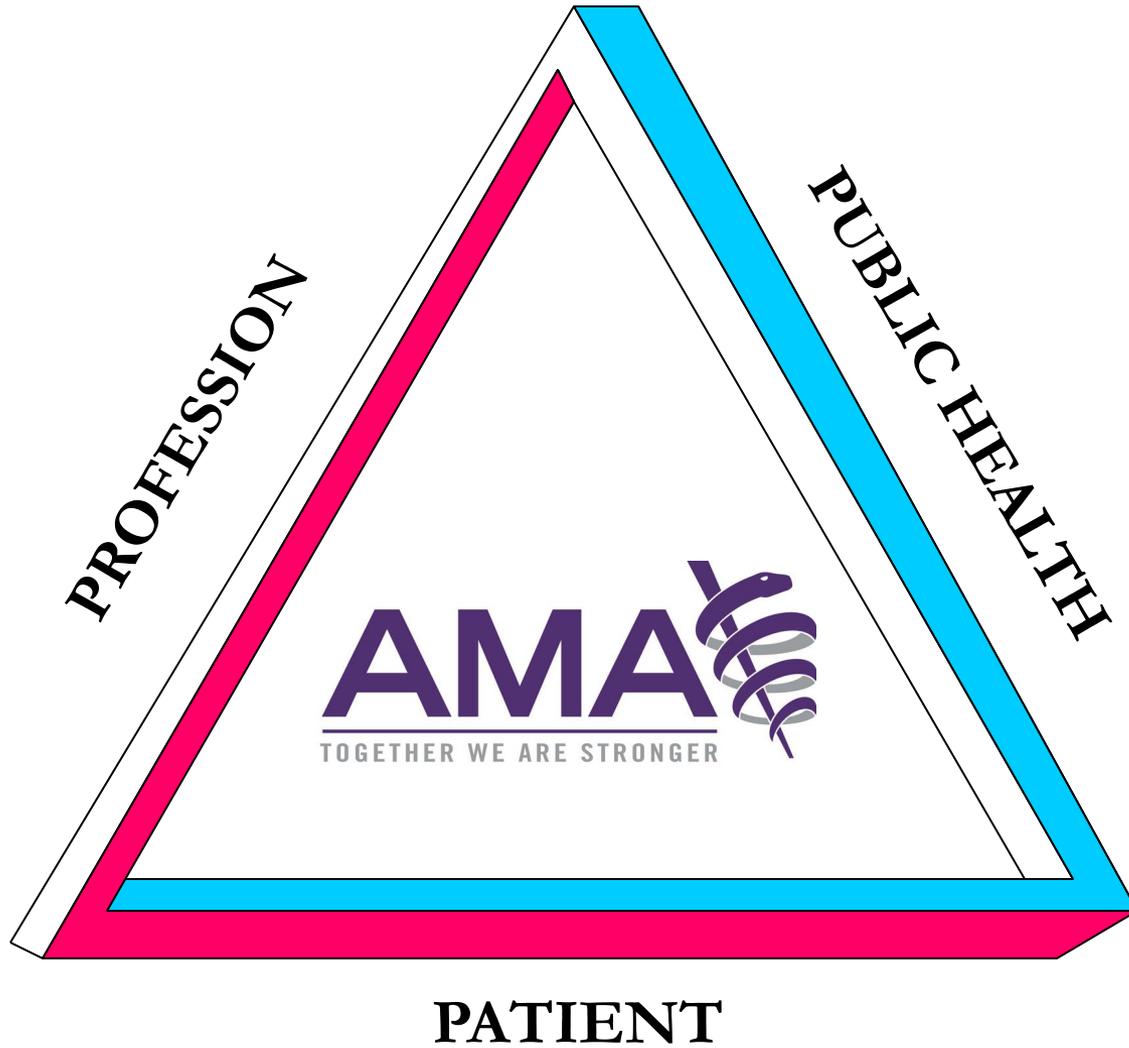
**LEADERSHIP**

**PEOPLE**

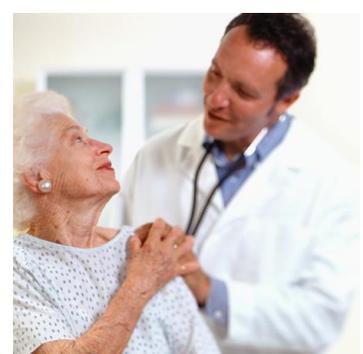
**RESOURCES**







Every Physician  
Has a Secondary  
Specialty  
And That is Public  
Health



# MDs/DOs

80:20

20:80

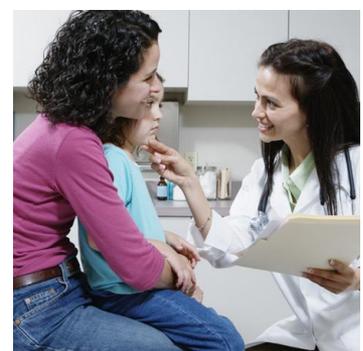
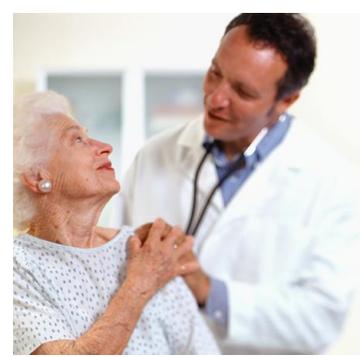
# The DISASTER Paradigm

- **D detect**
- **I incident command**
- **S scene safety and security**
- **A assess hazards**
- **S support needed**
- **T triage/treatment**
- **E evacuation**
- **R recovery**

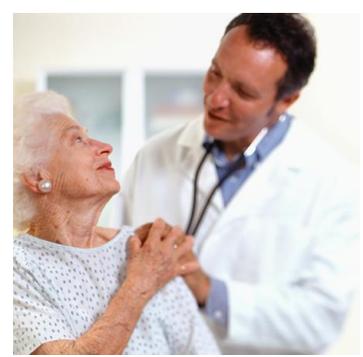


# PRE - disaster Paradigm

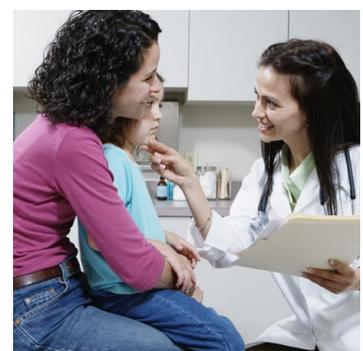
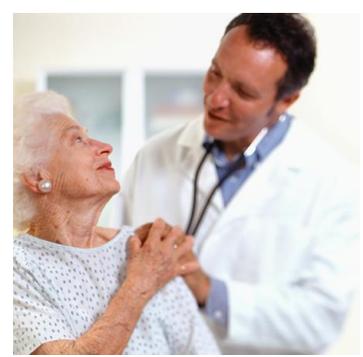
Planning  
Resourcing  
Education

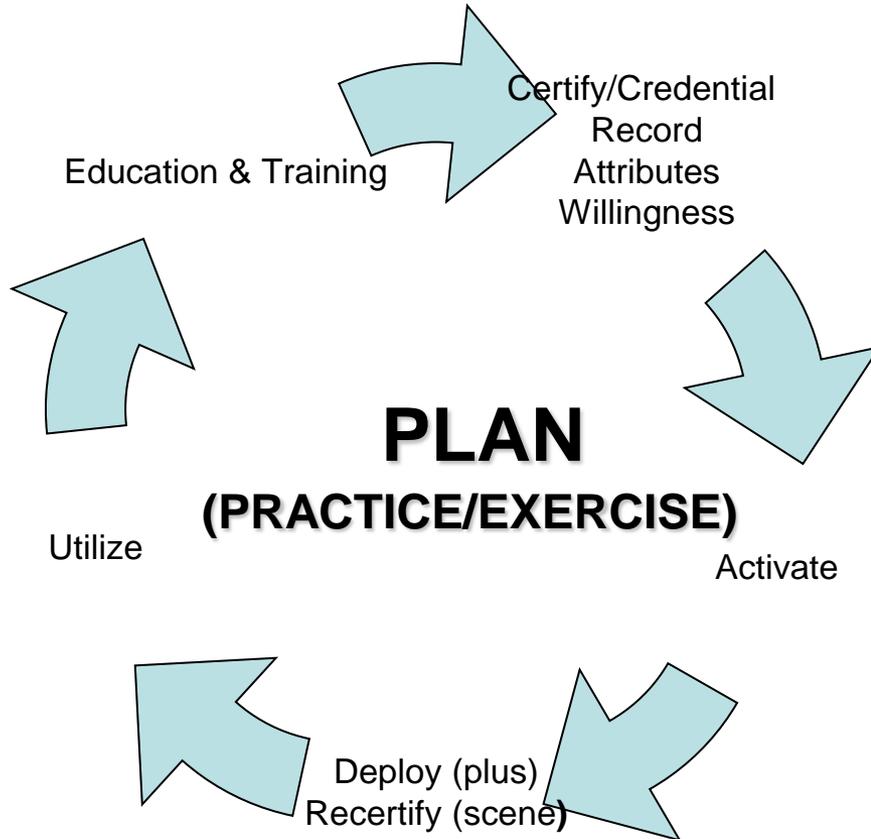


We have a great deal of government in regard to health matters, but it is local, unsystematized and often conflicting in different sections of the country and is distributed also, so far as it relates to national affairs, under different departments of the government, thus preventing the best results.



# HSPD-21 SYSTEM DISCIPLINE





# WMD STATE AND LOCAL TRAINING REQUIREMENTS



4,774,000



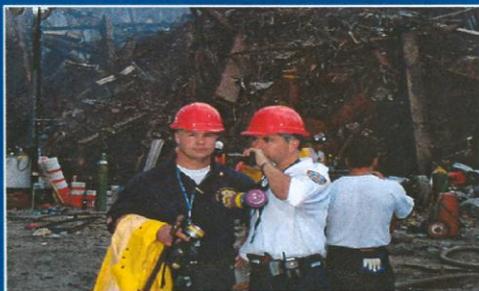
1,659,000



1,793,000



50,000



2,280,000



485,000

... Plus federal and private responder training requirements

# Consensus-based competencies in disaster medicine and public health preparedness for all health professionals

## Summary



Adapted from: Subbarao I, Lyznicki JM, Hsu EB, Gebbie KM, Markenson D, Barzansky B, Armstrong JH, Cassimatis EG, Coule PL, Dallas CE, King RV, Rubinson L, Sattin R, Swienton RE, Lillibridge S, Burkle Jr FM, Schwartz RB, James JJ. A consensus-based educational framework and competency set for the discipline of disaster medicine and public health preparedness. *Disaster Med Public Health Preparedness*. 2008;2:57-68.

**AMA**  
AMERICAN  
MEDICAL  
ASSOCIATION

**AMA**

# Competency Domains

1.0 Preparation and Planning

2.0 Detection and Communication

3.0 Incident Management and Support Services

4.0 Safety and Security

5.0 Clinical/Public Health Assessment and Intervention

6.0 Contingency, Continuity, and Recovery

7.0 Public Health Law and Ethics

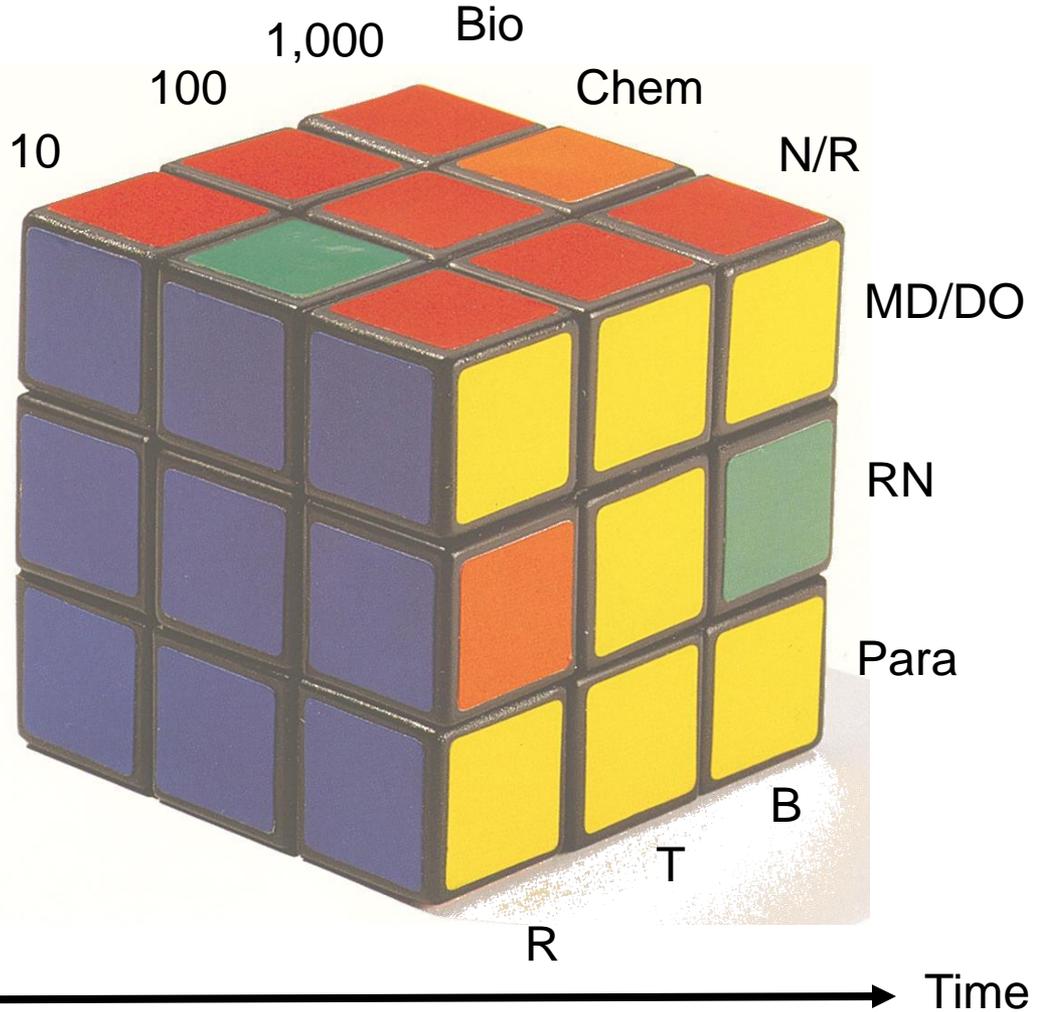
# Health System Responder Level of Proficiency

**Informed Worker/Student:** Health system professionals and students who require understanding in a particular aspect of disaster planning, mitigation, response, or recovery. These persons should be able to describe core concepts or skills but may have limited ability to apply this knowledge.

**Practitioner:** Health system professionals who are required to apply clinical or public health knowledge, skills, and values in disaster planning, mitigation, response, and recovery.

**Leader:** Health system professionals with administrative decision-making roles or functions in disaster planning, mitigation, response, or recovery.

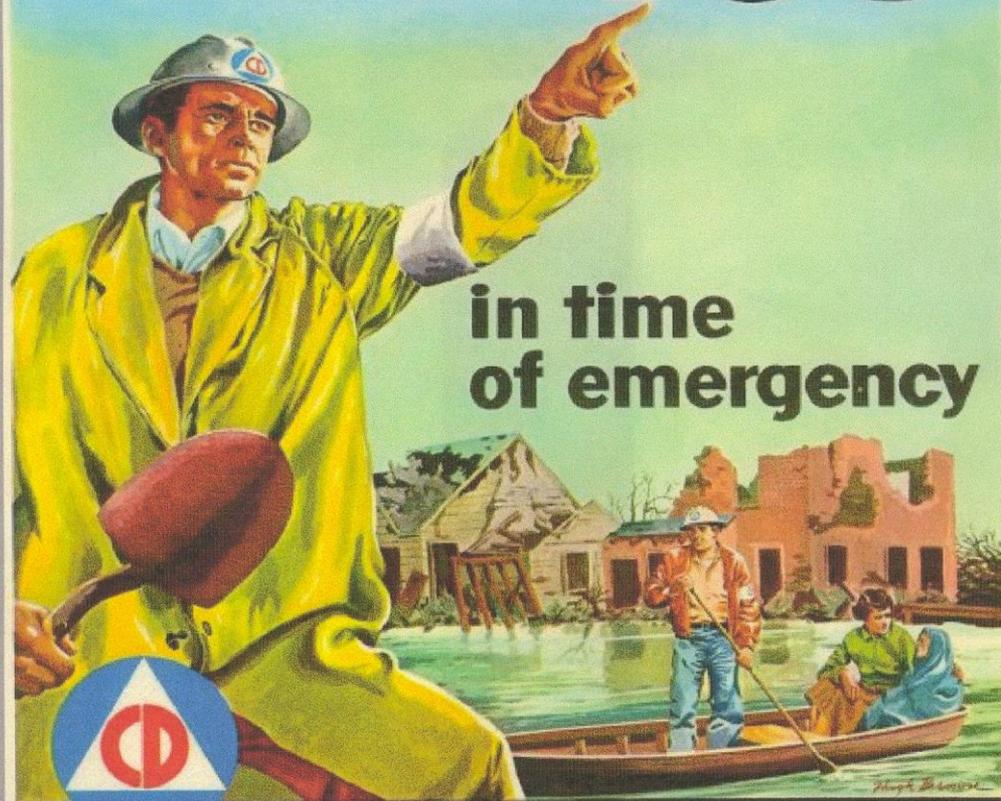
Geo-Climatic



Competencies

2003 [www.civildefensemuseum.com](http://www.civildefensemuseum.com)

# SERVING YOU



**in time  
of emergency**



**Support CIVIL DEFENSE**



**Connecting Leaders. Protecting People.**

# 1st National Congress on Public Health Readiness

*Mobilizing Public Health and Health Care Leaders  
for Community Action*

July 20–22, 2004  
Grand Hyatt Hotel, Washington, DC

*In partnership with*

American Medical Association  
Physicians dedicated to the health of America



# Disaster Medicine and Public Health Preparedness

An Official Publication of the American Medical Association

[www.dmphp.org](http://www.dmphp.org)

**NOW**  
AVAILABLE IN  
MEDLINE!

Photo by Shannon Doocy, PhD



## IN THIS ISSUE

- Prevalence and Predictors of Mental Health Distress Post-Katrina
- Unexplained Deaths in Connecticut 2002–2003: Failure to Consider Category A Bioterrorism Agents
- Cash Grants in Humanitarian Assistance: 2004 Indian Ocean Tsunami
- Secondary Contamination of Medical Personnel
- Analyzing Postdisaster Surveillance Data

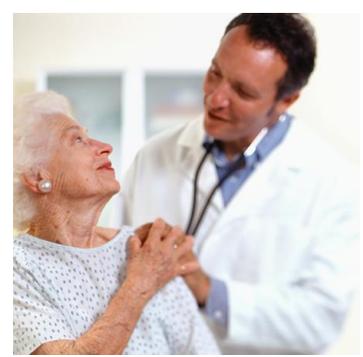


Wolters Kluwer  
Health

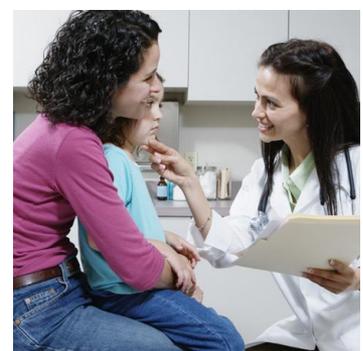
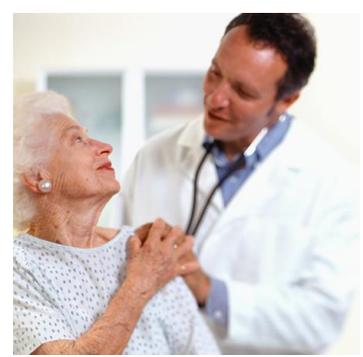
Lippincott  
Williams & Wilkins

*There go my people, I must find out where they are going so I can lead them.*

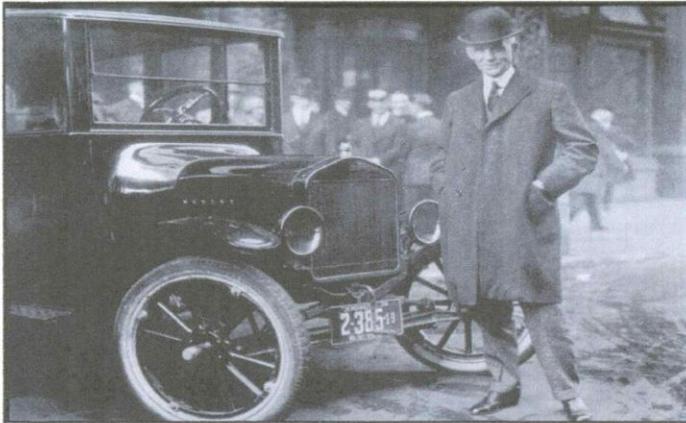
*-Alexandre Ledru-Rollin*



LEADERS  
BY  
POSITION  
PROFESSION  
PERSONALITY

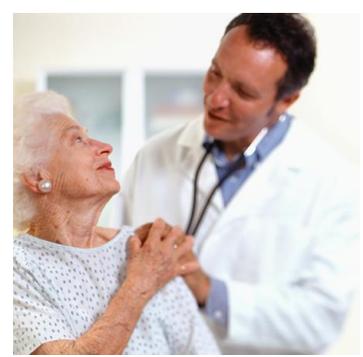


## Henry Ford – on partnership



“Coming together is  
a beginning;  
keeping together is  
progress;  
working together is  
success.”

# Pandemic Influenza Countermeasures Community Mitigation Resilience



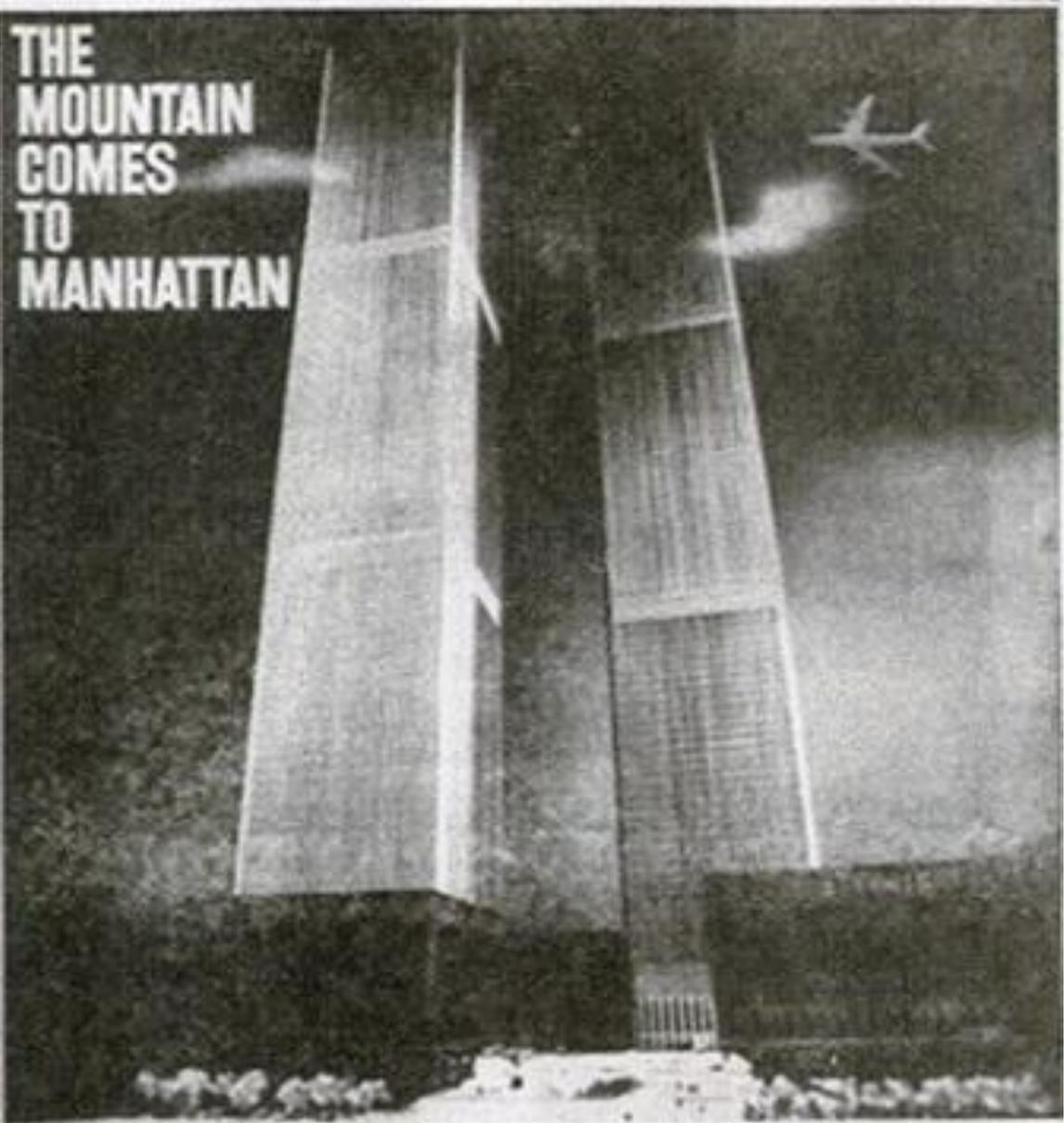


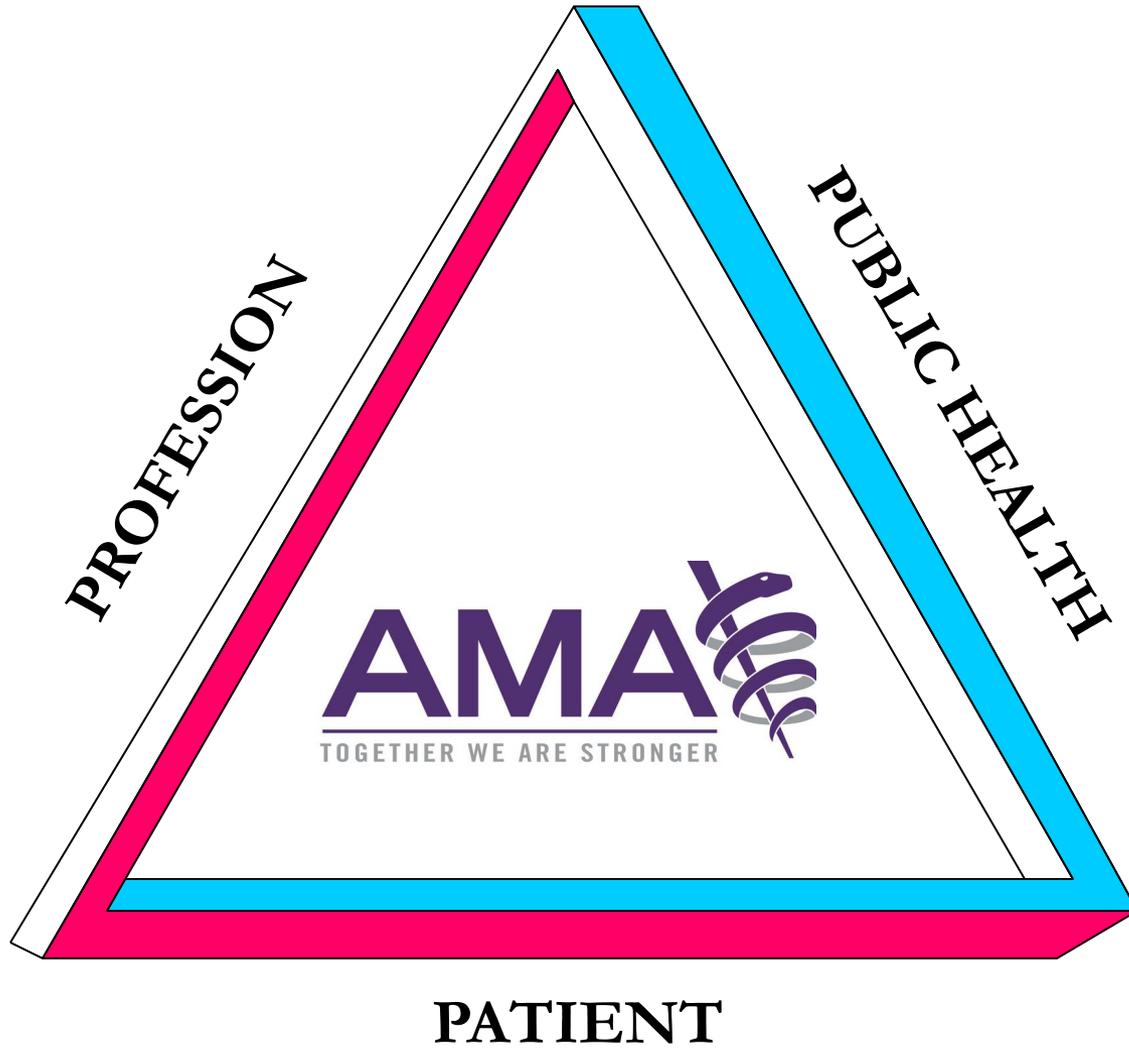
# Objectives



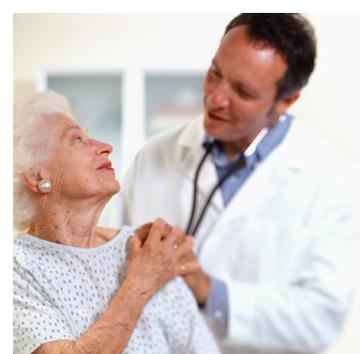
- Interpret basic influenza virology and epidemiology.
- Describe the unique limitations of targeted countermeasures.
- Explain the role of community mitigation.
- Distinguish between concepts of individual/community resilience.







Every Physician  
Has a Secondary  
Specialty  
And That is Public  
Health





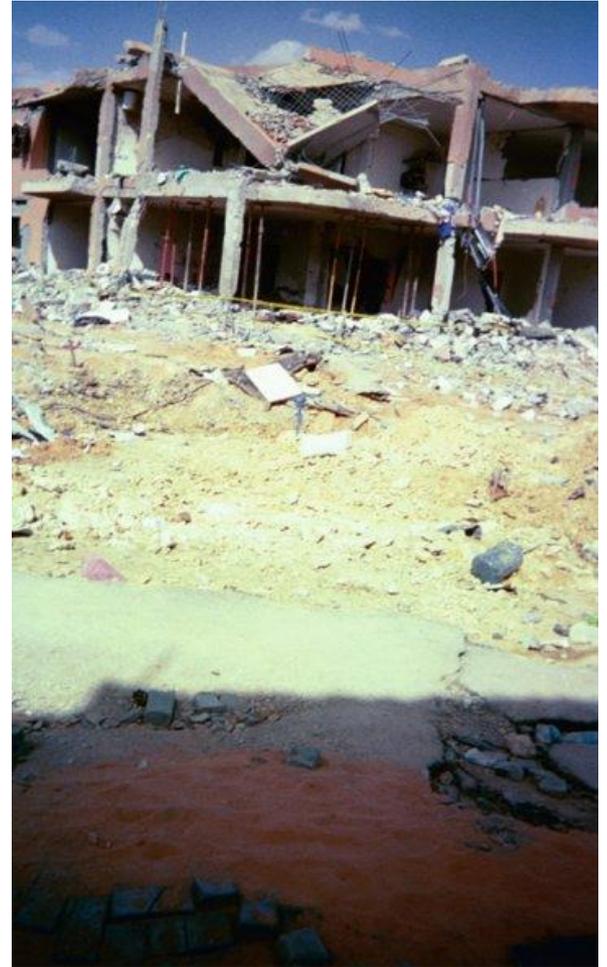
MDs/DOs

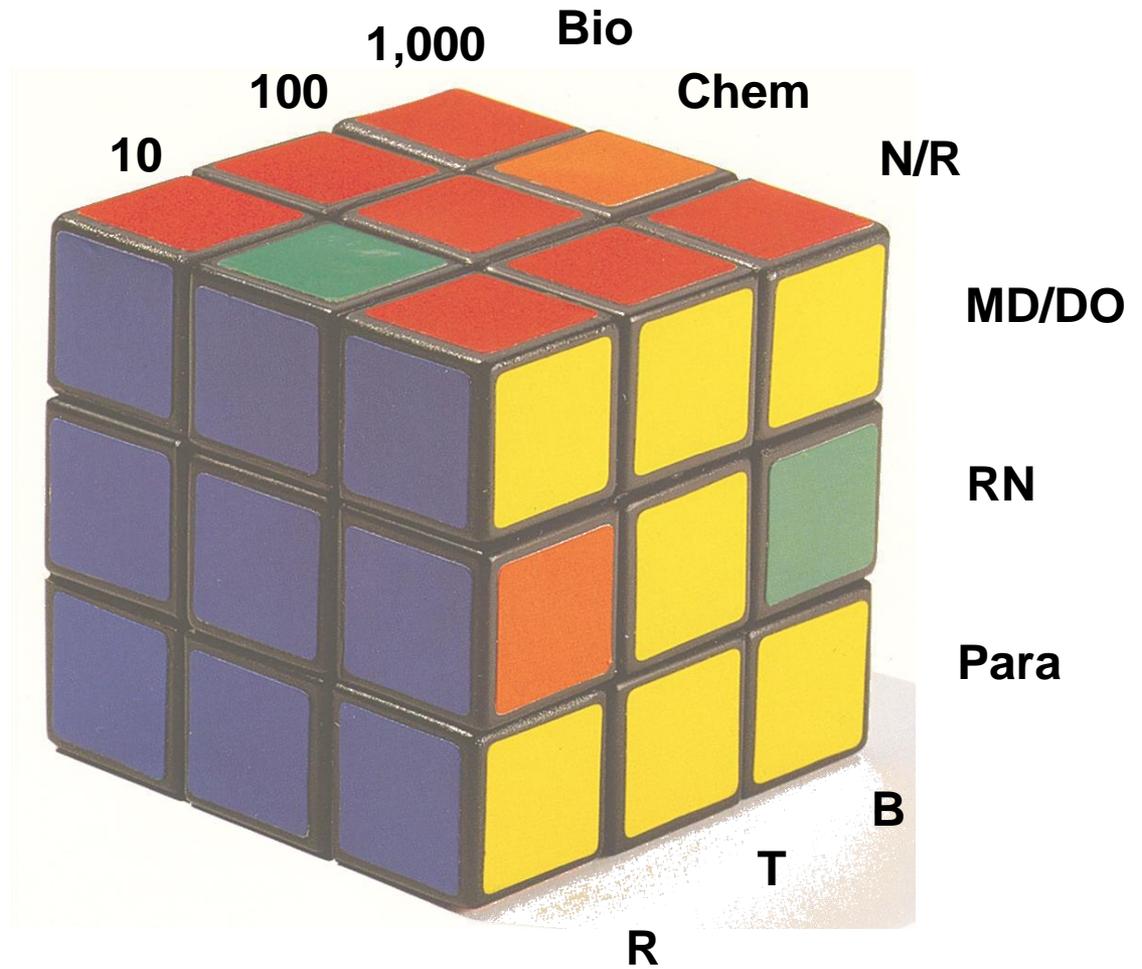
80:20

20:80

# The DISASTER Paradigm

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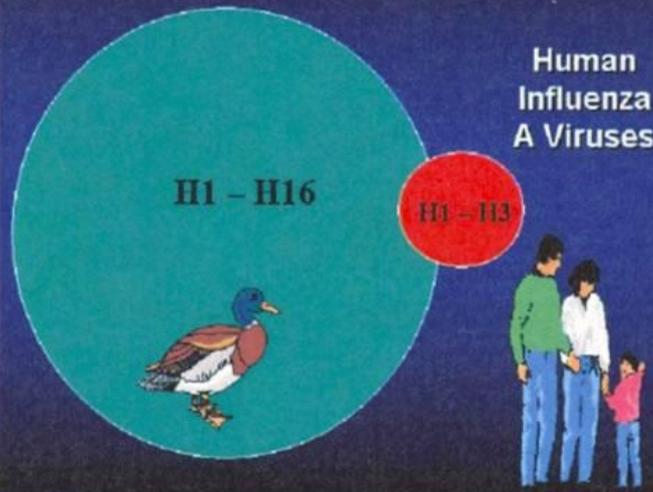




# Competencies

# Avian Influenza (Bird flu)

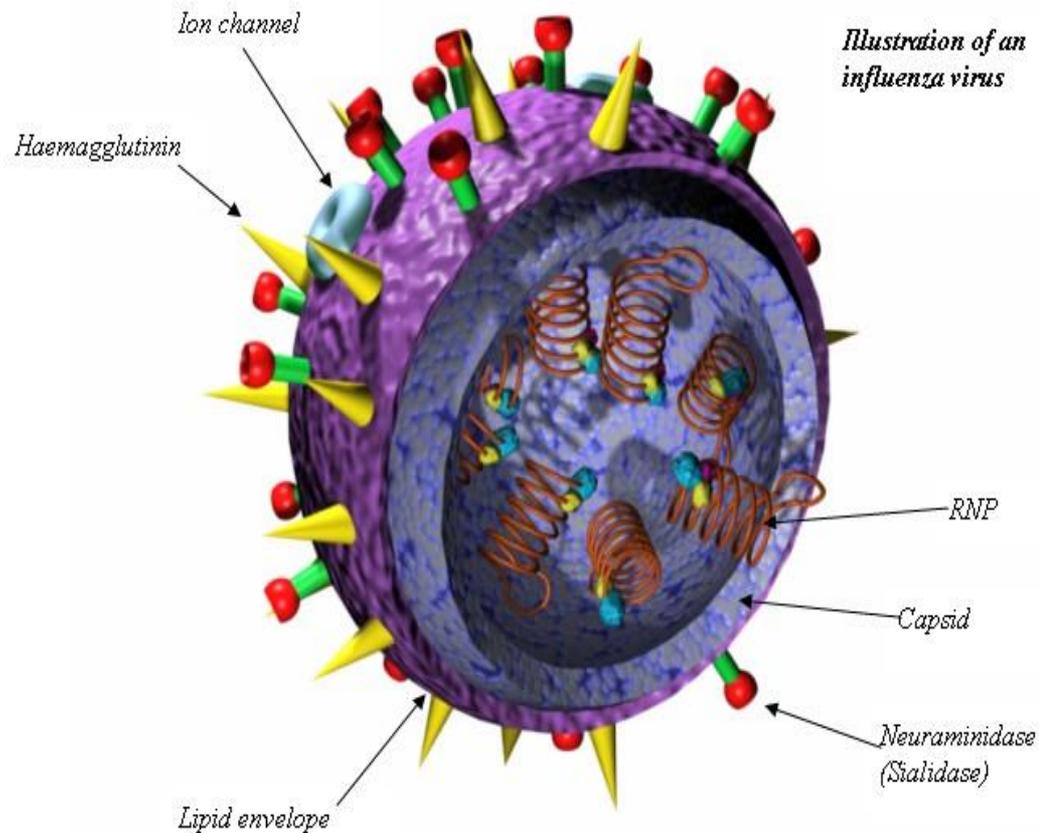
## Avian Influenza A Viruses

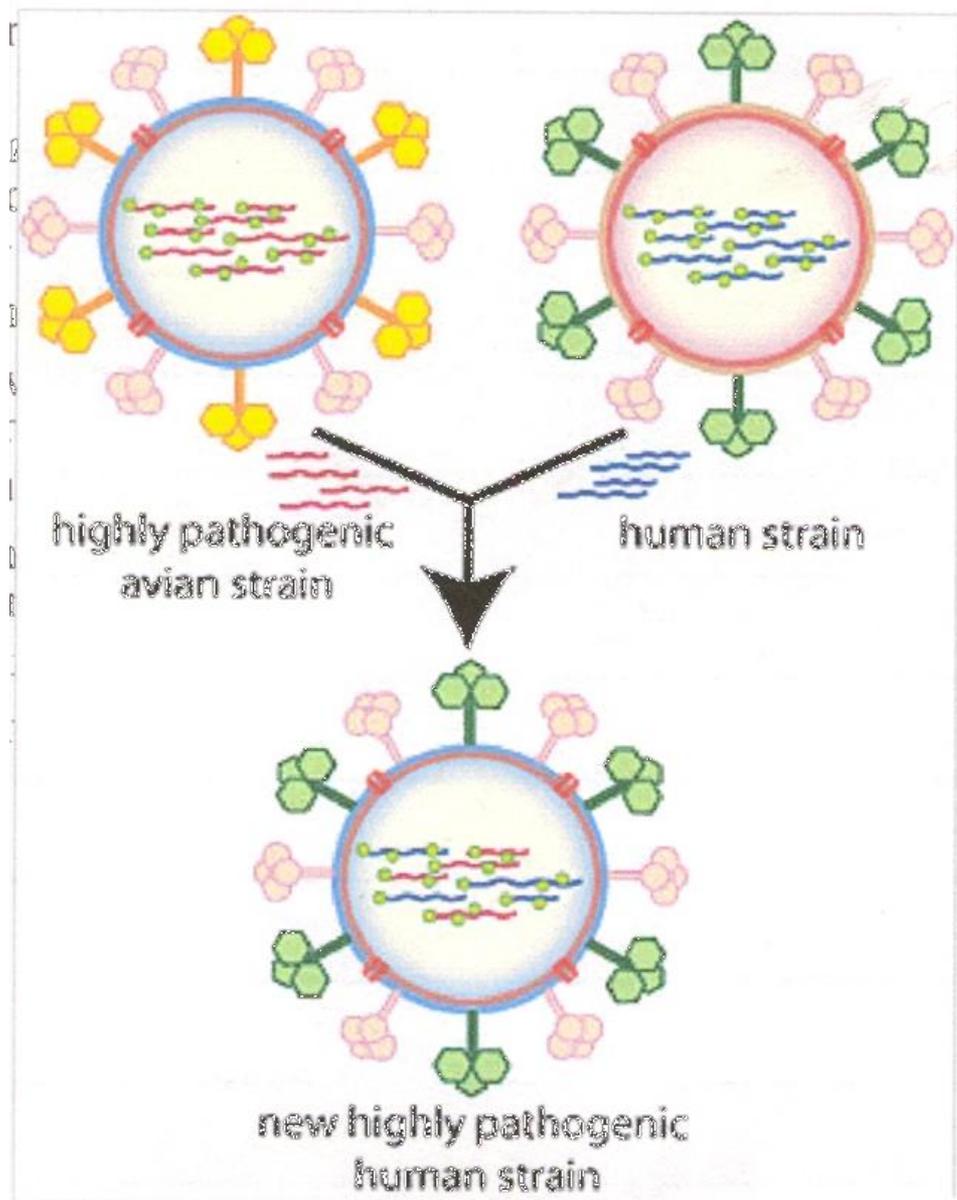


- Disease mainly of birds
- Rarely infects people
  - No human immunity
  - May cause serious disease in humans
- If an avian virus changes (mutates) it could spark an influenza pandemic

# Know your enemy!

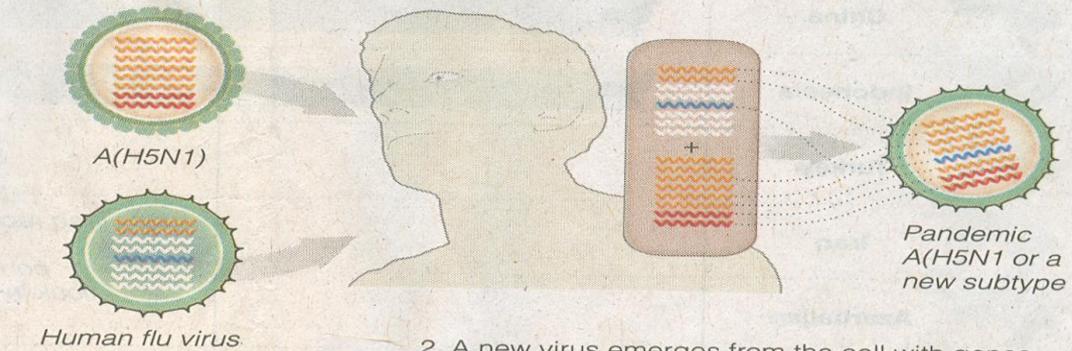
Any hope of preventing an infectious disease rests in knowing and understanding the unique properties of the pathogenic agent.





**2. Gene swap** (how the 1957 and 1968 flu pandemics developed)

The genetic content of all flu viruses is segmented into eight genes. If a human (or pig) is infected with both H5N1 and another flu virus, the two could swap genes.

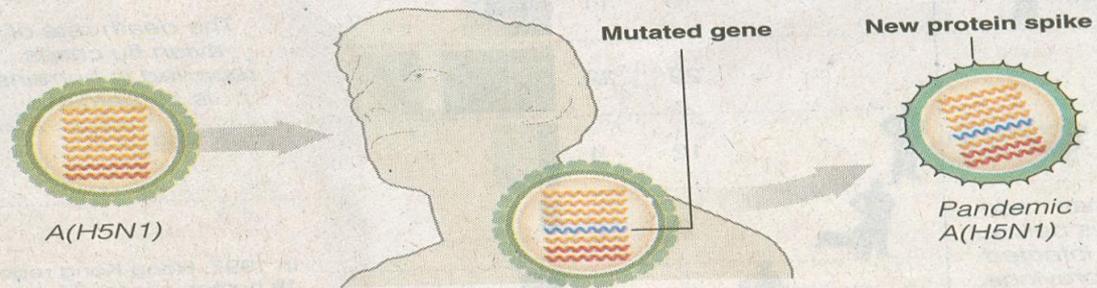


1. Both viruses enter human cell and begin replicating.

2. A new virus emerges from the cell with genes from each of the viruses. The new virus could gain a new protein spike or be a whole new virus subtype unfamiliar to the immune system.

**1. Adaptation** (how the 1918 flu pandemic may have developed)

Influenza A viruses often make small mutational errors every time they replicate. This is a slow process, which scientists might be able to detect early.



1. Virus enters human host.

2. While replicating, the gene governing the protein spike gradually mutates.

3. A mutated gene could produce viruses with a receptor that attaches easily to human cells.

Sources: World Health Organization; Centers for Disease Control and Prevention; Science; Nature

The  
Great  
Influenza

THE EPIC STORY OF THE DEADLIEST  
PLAGUE IN HISTORY



John M. Barry

*author of Rising Tide*

**Known flu pandemics<sup>[23][19]</sup>**

<b>Name of pandemic</b>	<b>Date</b>	<b>Deaths</b>	<b>Subtype involved</b>
<b>Asiatic (Russian) Flu</b>	1889–1890	1 million	possibly H2N2
<b>Spanish Flu</b>	1918–1920	40 to 100 million	H1N1
<b>Asian Flu</b>	1957–1958	1 to 1.5 million	H2N2
<b>Hong Kong Flu</b>	1968–1969	0.75 to 1 million	H3N2

# 1918 Influenza Pandemic

1 in every 4 sickened (25% morbidity)

675,000 deaths in the U. S. (2.5 % mortality)

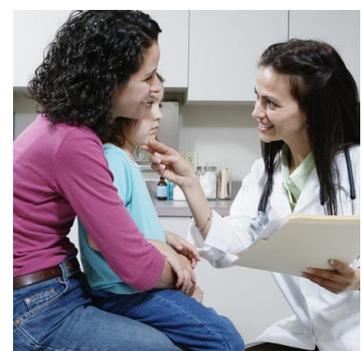
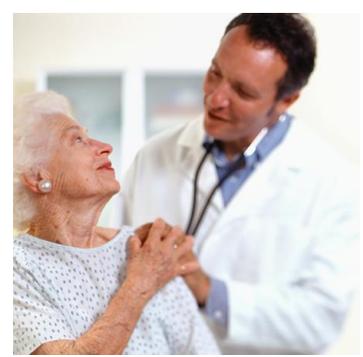
Suppressed the average life expectancy in the U.S. by more than 10 years

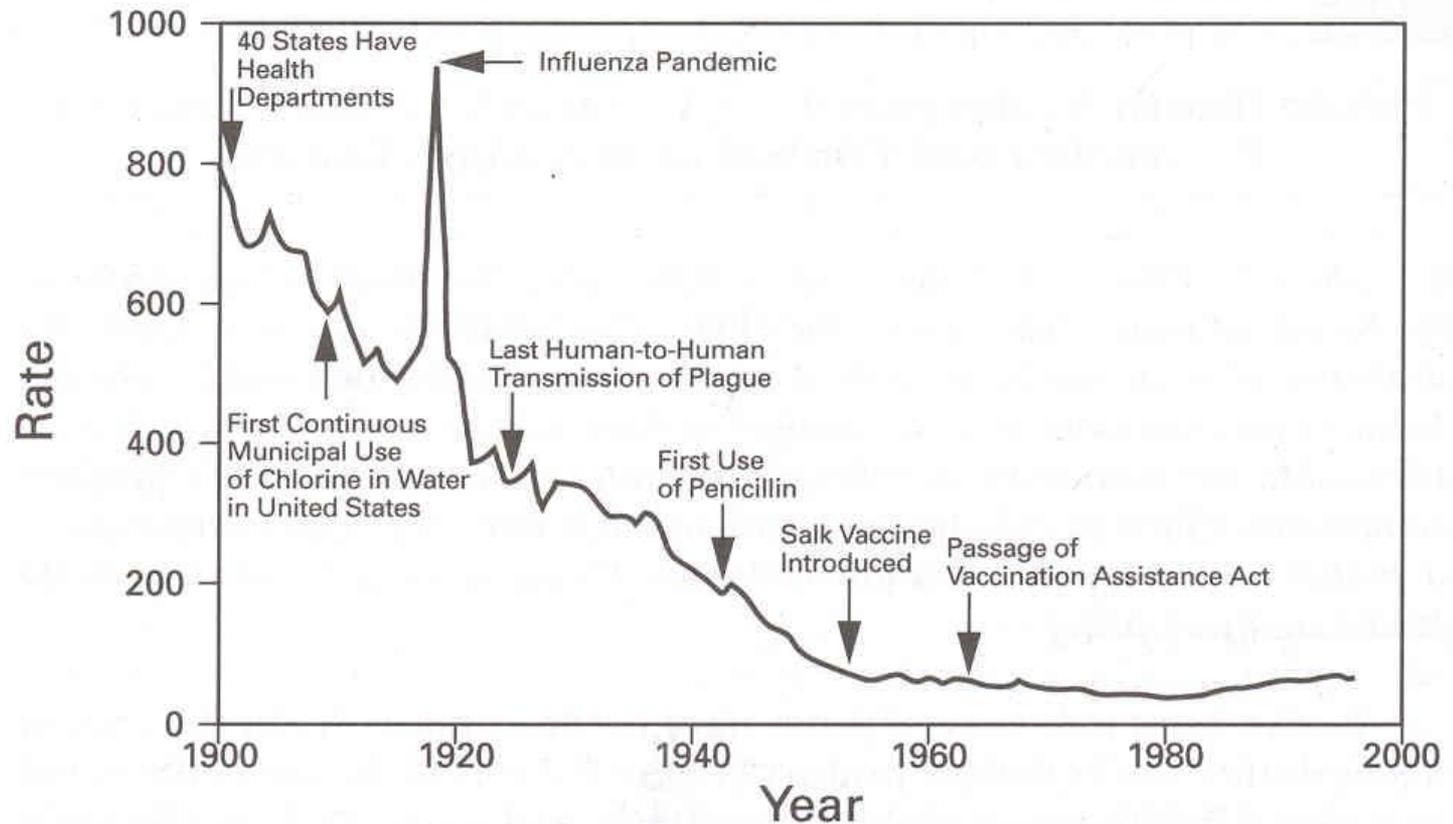
More deaths than the combined deaths in both World Wars and Korean war

More deaths in 24 weeks than AIDS/HIV deaths in 24 years

More deaths in one year than the Black Death killed in a century

Comparable deaths based on today's population would be 1,750,000





**Figure 1-3** Crude Death Rate (per 100,000) for Infectious Diseases—United States, 1900–1996. *Source:* Reprinted from Public Health Achievements, United States, 1900–1999: Control of Infectious Diseases, *Morbidity and Mortality Weekly Report*, Vol. 48, No. 29, pp. 621–629, the Centers for Disease Control and Prevention, 1999.

# 1918

## Dr. Loring Miner's "unusual outbreak"

Haskell County, Kansas-population = 1720

578 square miles

Grain, poultry, and hog farmers

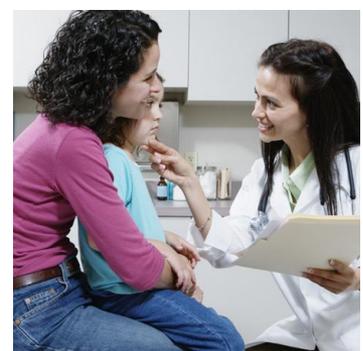
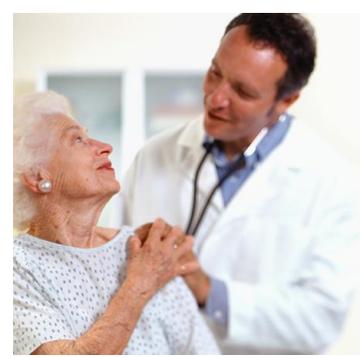
Isolated from each other by distance

February and March 1918...dozens of unrelated patients with FLI

Healthiest and strongest are ill

Progressive deterioration to pneumonia; 3/18 die

Warning published in USPHS *Public Health Reports*



# Environmental Factors in 1918

Close living quarters of military bases. Wartime transmission

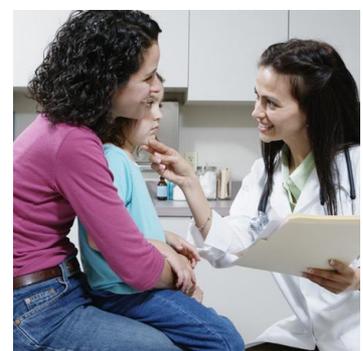
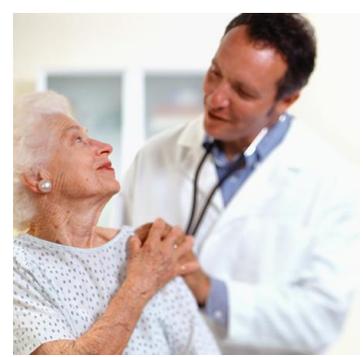
Poor hygiene, unsanitary environments

Transportation on crowded trains and troop ships

Poultry and hog sales directly to military bases.

Poultry production accessible to wild bird influence and un-chlorinated water supply.

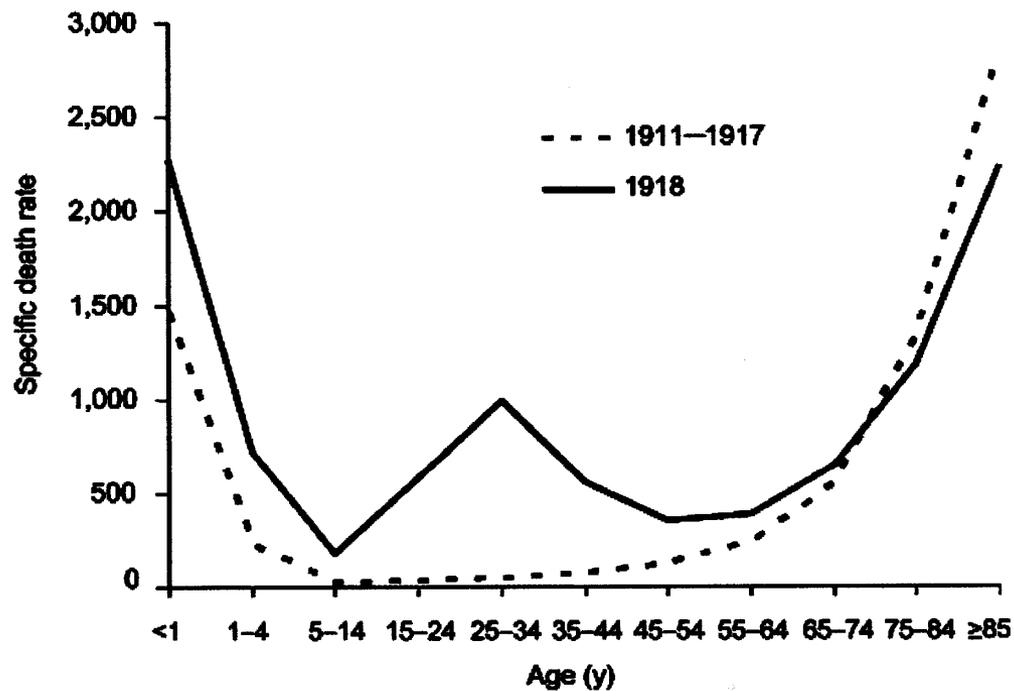
Live bird markets common

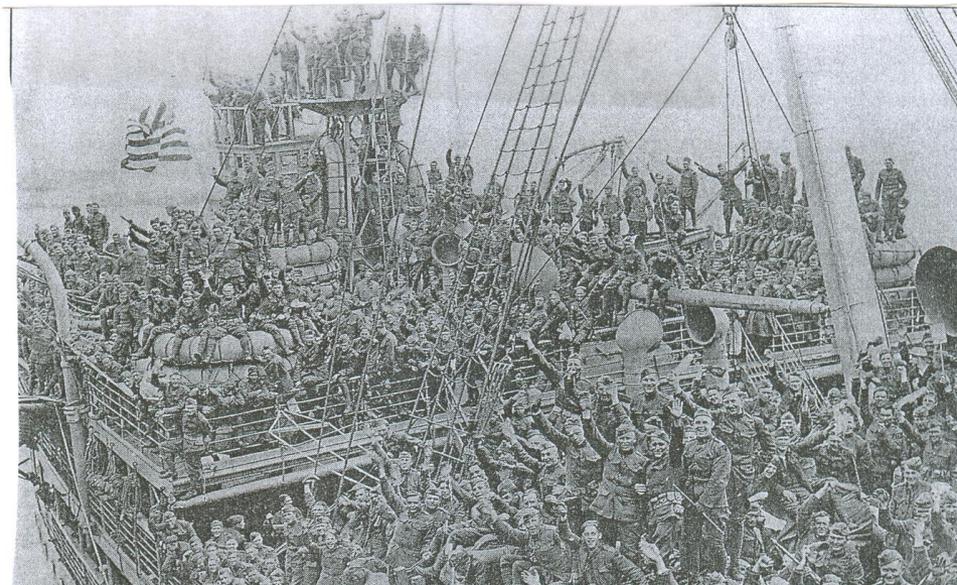


# W Curve

From Wikipedia, the free encyclopedia

- Image
- File history
- File links

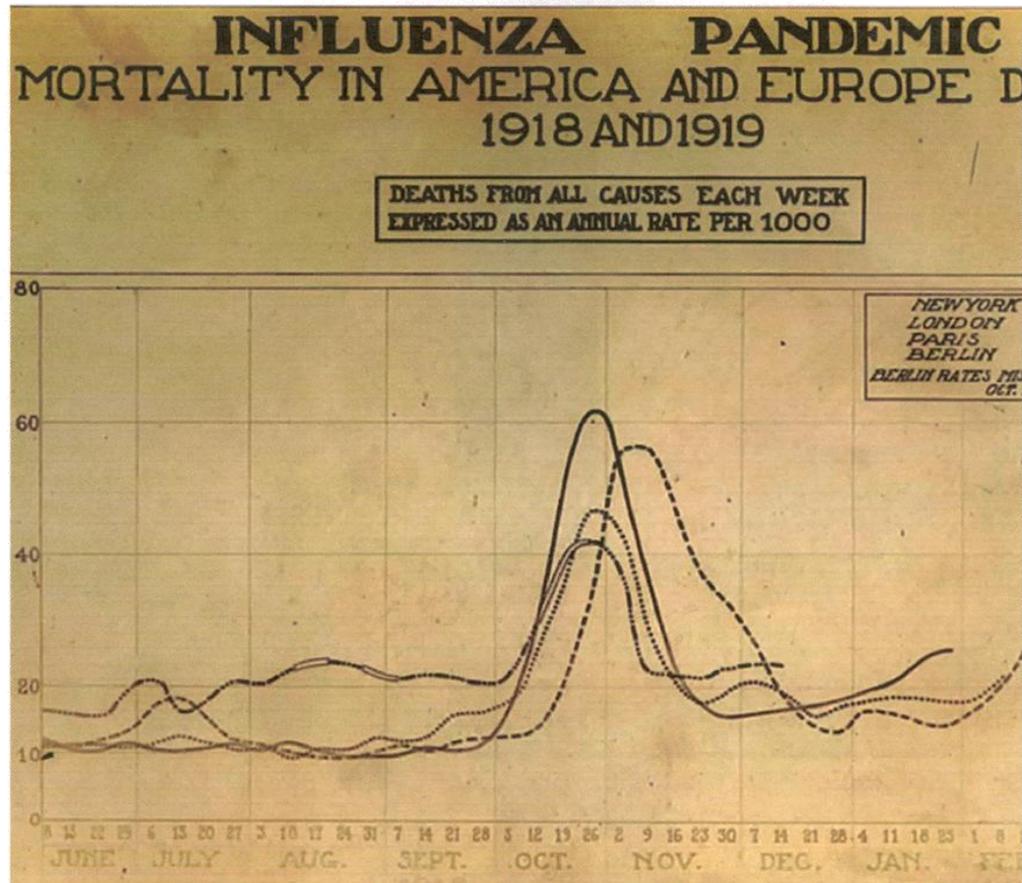


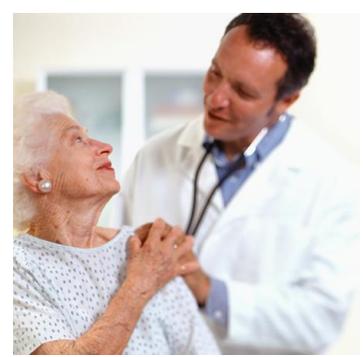


# Spanish Flu Death Chart

From Wikipedia, the free encyclopedia

- Image
- File history
- File links





“By the end of the Second World War it was possible to say that almost all the major practical problems of dealing with infectious disease had been solved.”



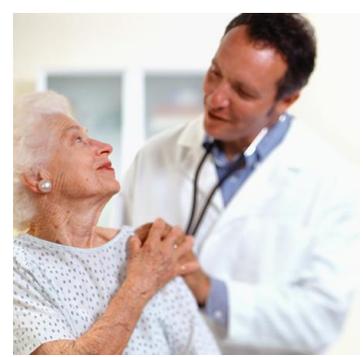
“The late 20<sup>th</sup> century will be the witness to the virtual elimination of infectious disease as a significant factor in social life.”

- Sir McFarlane Burnet  
Nobel Laureate, 1962



**Then in 1962 with the advent and mass production of the “magic bullet,” antibiotics, Sir McFarlane Burnett, an immunologist who was the first to study how the body’s immune system distinguished self from non-self, said...**





It is time to “close the book on infectious diseases.”

“The war on infectious diseases has been won.”

-Dr. William H. Stewart  
Surgeon General, 1969



Finally, the US Surgeon General in 1969 stated with absolute certainty, that...

On that note, I'd like to end my lecture! Seriously, if that is the case, then why are we all here?

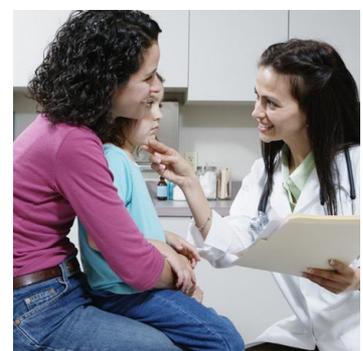
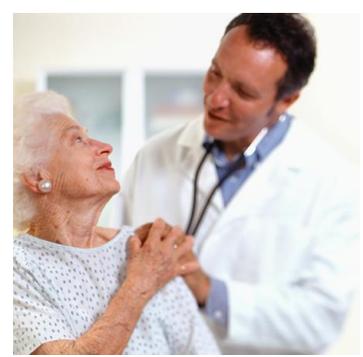


adventures left in the world. The dragons are all dead and the lance grows rusty in the chimney corner...About the only sporting proposition that remains unimpaired by the relentless domestication of a once free-living human species is the war against those ferocious little fellow creatures. Which lurk in the dark corners and stalk us in the bodies of the rats, mice and all kinds of domestic animals; which fly and crawl with the insects, and waylay us in our food and drink and even in our love.

-Hans Zinsser, 1934

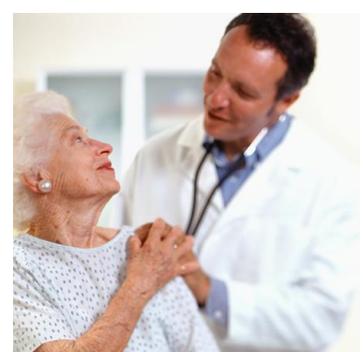
-Famed bacteriologist,  
historian

In: Rats, Lice, and  
History



“the Martians – dead! ... slain after all man’s  
devises had failed, by the humblest things  
that God, in his wisdom, had put upon this  
earth...these germs of disease”

The War of the Worlds  
H.G. Wells



“The ravaging epidemic of AIDS has shocked the world...We will face similar catastrophes again...We have too many illusions that we can...govern the remaining vital kingdom, the microbes, that remain our competitors of last resort for dominion of the planet.”

-Josh Lederberg

Nobel Laureate

JAMA 1988;260:684-5

The 1980s introduced us to a disease that woke us all up and made us realize that indeed, we were wrong, that, Josh Lederberg stated in a JAMA article in 1988..



The sudden appearance of an epidemic typically inspires rapt attention, panic and action. Once the crisis subsides, public attention wanes although the threat of contagion continues, especially among the world's poor.

Compare our response to severe acute respiratory syndrome, or SARS, with the more familiar germs that plague us daily. Compare it to the dangers of smoking or getting in a car and heading out on the road. Every life is precious, but when you look at the numbers, SARS just isn't as formidable a threat as we've made it out to be. Its death rate is far lower than that for AIDS or malaria; coronaviruses, like the one believed to cause SARS, tend to be most active in the winter and early spring.

In addition to taking the steps necessary to keep SARS at bay—watching out for new cases and isolating people who are contagious to others—we would do well to channel our energies into something more lasting: a permanent, integrated and accountable global public health system for the surveillance and prevention of the microbes that are certain to emerge in the future. Right now, worldwide accounting of disease is incomplete at best, hampered in large measure by sketchy reporting from developing countries. These gaps slowed our containment of SARS and allowed rumor to spread more rapidly than reliable information. When the facts are few, it's easy for fear to fill the vacuum.

Howard Markel, professor of pediatrics and communicable diseases at the University of Michigan, is author of the forthcoming "When Germs Travel."

# THE EPIDEMIC SCORECARD

By Howard Markel and Stephen Doyle

Estimates of disease incidence and mortality are from the World Health Organization

**2 MILLION DEATHS A YEAR**  
**8 MILLION NEW CASES A YEAR, AND CLIMBING**

ONE THIRD OF THE WORLD'S POPULATION IS INFECTED WITH

# Tuberculosis

in the last hour, more than 200 people have died of tuberculosis

EACH YEAR 1 PERCENT OF THE WORLD BECOMES INFECTED WITH THE TB GERM

INFECTIOUS DROPLETS TRANSMITTED BY  
\* BREATHING \* COUGHING \*  
\* SNEEZING \* EVEN SPEAKING \*

TO BE EFFECTIVE, TB DRUGS MUST BE TAKEN FOR SIX TO EIGHT MONTHS

DRUG-RESISTANT STRAINS ARE INCURABLE (AND MULTIPLYING)

**MORE THAN 100 DEATHS AN HOUR**

# MALARIA

BORNE BY MOSQUITOES

Medicines exist to fight many strains of the malaria parasite, but public health workers are concerned about drug-resistant forms of the disease. Prevention (mosquito control) is the most effective.

**1 MILLION DEATHS A YEAR**  
**300-500 MILLION NEW CASES A YEAR**

**1 MILLION DEATHS A YEAR / 10-30 MILLION NEW CASES A YEAR**

# HEPATITIS B VIRUS

puts you at high risk for cirrhosis, liver cancer, liver failure and death

TRANSMITTED VIA

- Mother to child at birth
- Unsafe injections or transfusions
- Sexual contact

No effective treatment. Vaccine can block chronic infection, but its high cost prevents its widespread distribution in poor nations.

# DIARRHEAL DISEASES

(Cholera, shigella, dysentery, typhoid, E. coli and others)

**1.9 MILLION DEATHS A YEAR**  
mostly infants and young children

**2.7 BILLION NEW CASES A YEAR**

Transmitted by contaminated food or water

**1.5 billion people do not have ready access to clean water**

# AIDS

**3.1 MILLION DEATHS A YEAR**  
**5.5 MILLION NEW CASES A YEAR**

**42 MILLION PEOPLE ARE H.I.V.-POSITIVE**

IN THE LAST HOUR, MORE THAN 300 PEOPLE HAVE DIED OF AIDS

mosquito-borne

# Dengue Fever

**24,000 DEATHS A YEAR**  
**20 MILLION NEW CASES A YEAR**

And...  
Cardiovascular disease (heart attack and stroke) deaths: 17 million a year  
Tobacco-related deaths: 3.5 million a year  
Motor vehicle fatalities: 1.26 million a year

# Measles

**NEARLY 900,000 DEATHS A YEAR**  
**30 MILLION NEW CASES A YEAR**

ENTIRELY PREVENTABLE WITH A VACCINE THAT COSTS 20 CENTS AND HAS BEEN AVAILABLE SINCE 1963

# INFLUENZA

**250,000 DEATHS A YEAR**  
**3-5 million new cases a year**

Entire world affected

# YELLOW FEVER

**30,000 DEATHS A YEAR**  
**200,000 NEW CASES A YEAR**

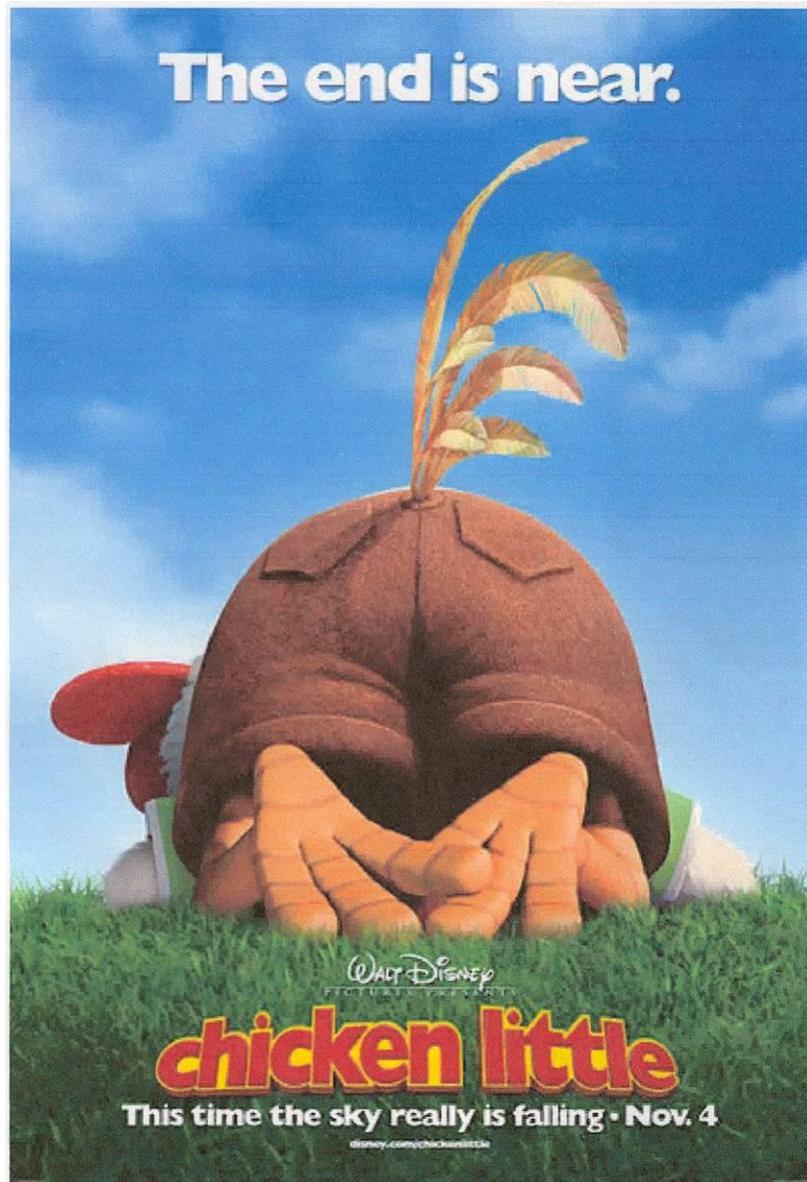
# SARS

**353 DEATHS** out of **5,462 cases** in 100 days





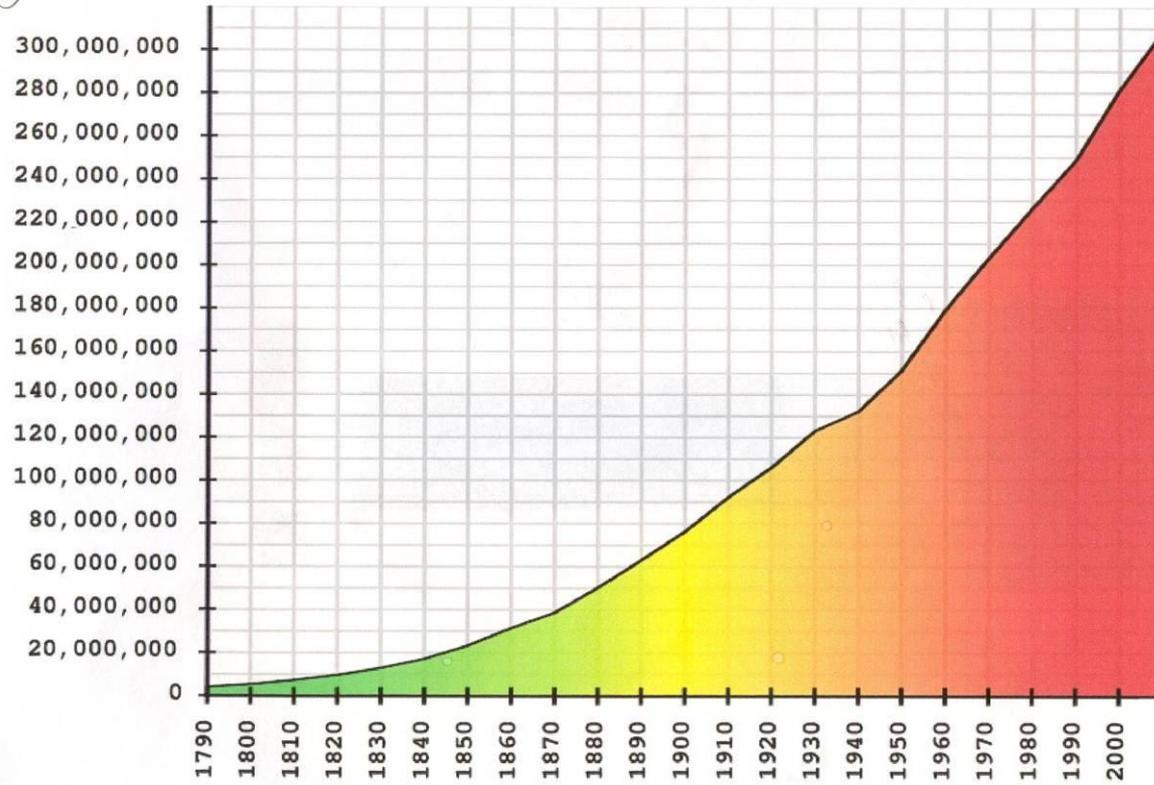
The end is near.



AMA 

Image:US Population Graph - 1790 to 2000.svg - Wikipedia, the free encyclopedia

(9)

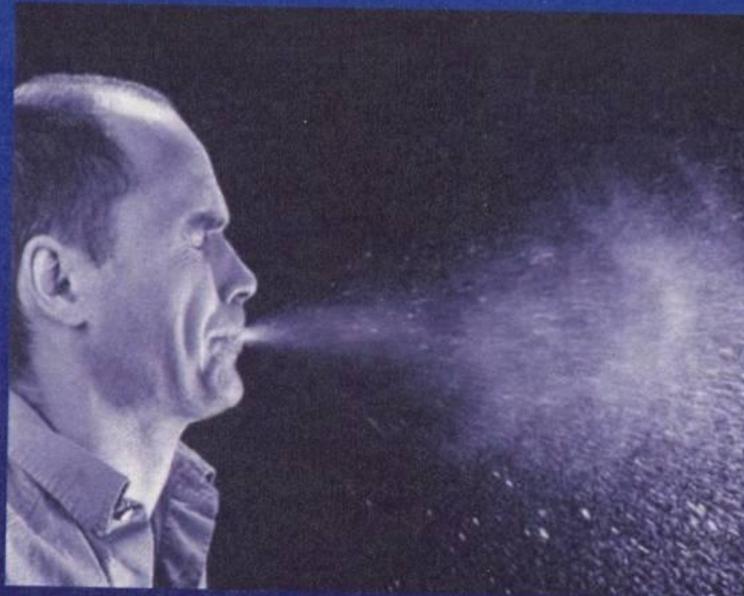


## What is a Pandemic?

- An influenza pandemic occurs when a new influenza virus...
  - Causes illness in people
  - Easily spreads from person-to-person
- We don't know when the next pandemic will occur, which influenza virus will cause it, or how severe it will be

Currently there is no human pandemic influenza in the world

## How Does Influenza Spread?



- Spread is person-to-person
- Mostly spread by coughing and sneezing
- Less often spread by touching contaminated surfaces or hands

Source: "infectious disease." Online Photograph. Encyclopædia Britannica Online. 21 Oct. 2007 <<http://www.britannica.com/eb/art-90104>>.

# Potential Tools in Our Pandemic Response Toolbox



- Community control measures
- Infection control (hygiene)
- Pandemic Vaccine
- Antiviral drugs



## Community Control Measures for a Severe Pandemic

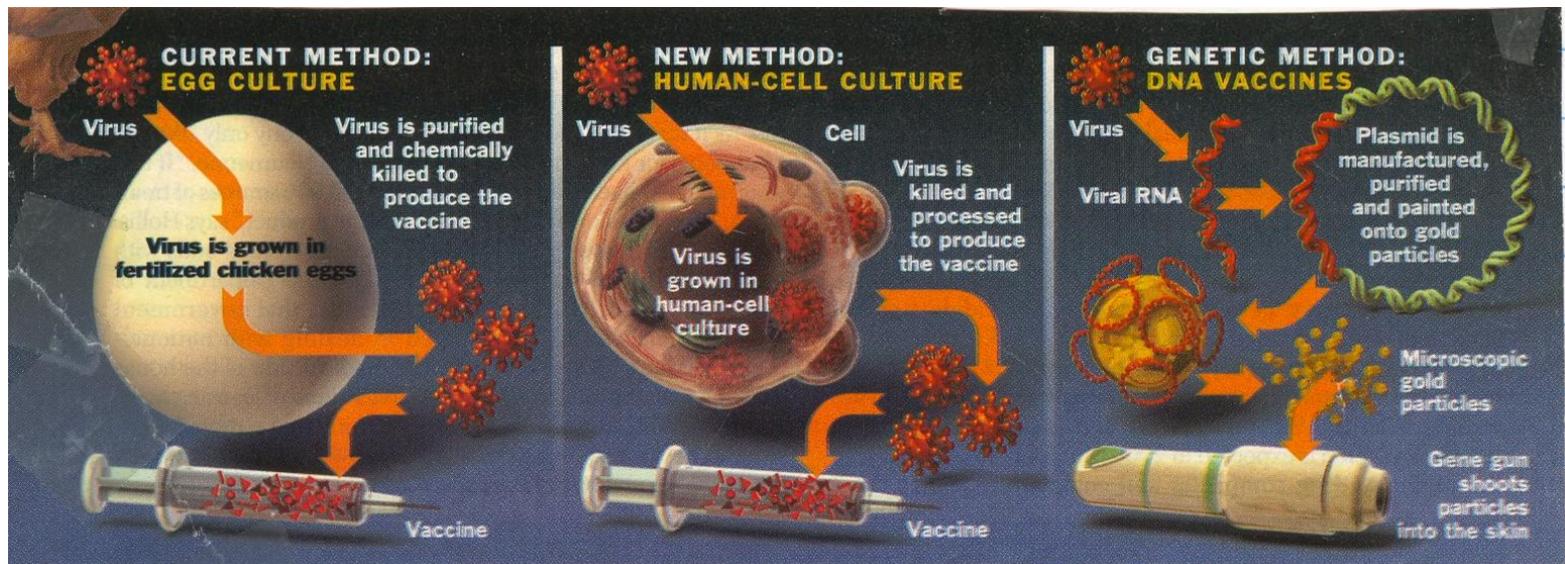
- Sick people stay home
- Household members of an ill person also stay home
- Schools dismiss students and child care programs close
- Public gatherings are cancelled
- “Social distancing” at work and in the community (reduce close contacts – within 6 feet – with others)

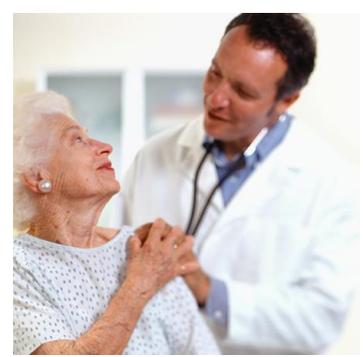
**70%**  
**to 90%**

Typical effectiveness of the flu vaccine

**44%**

Effectiveness of this year's flu vaccine





# Anti-Viral

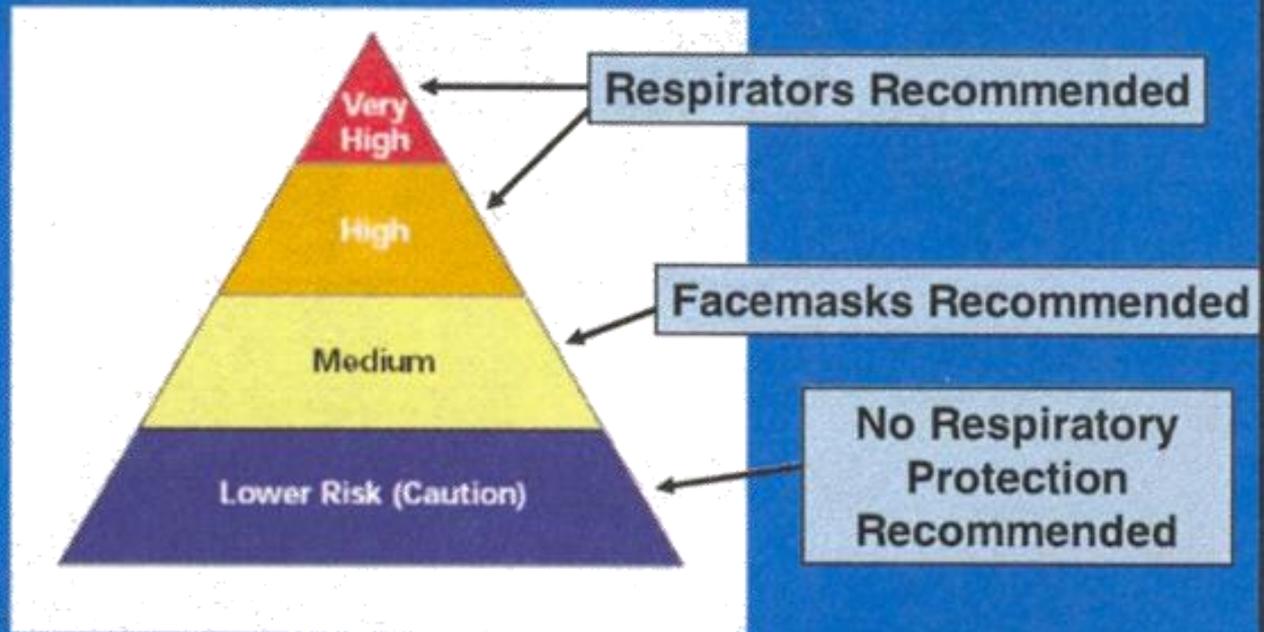


Adamantanes (M<sub>2</sub> Inhibitor) A

Neuraminidase Inhibitors (Tamiflu) B



# Occupational Risk Pyramid for Pandemic Influenza

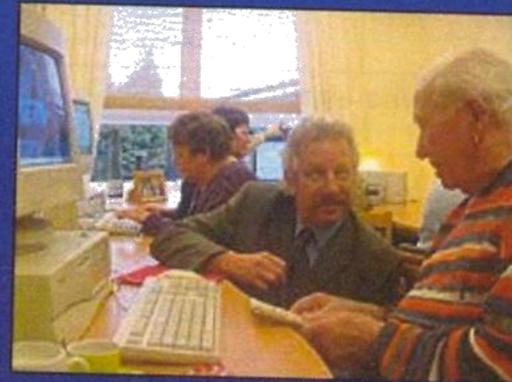
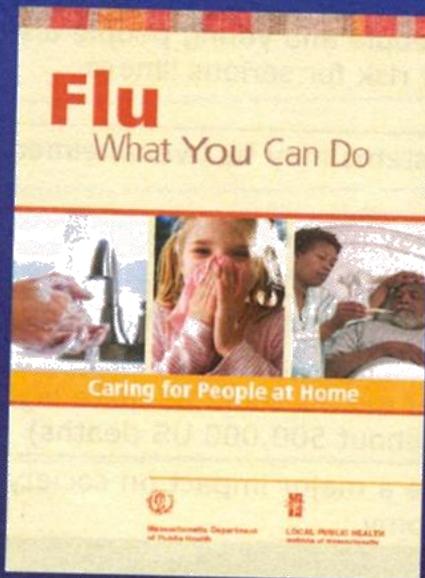


## How Are We Getting Prepared?

- Our government, communities, and businesses are making plans
- Hospitals are increasing their ability to handle a large number of sick people
- Antiviral drugs are being bought and stockpiled
- Vaccine production is being improved
- Planning is ongoing to use community control measures

## What Can You Do?

- Be informed ([www.pandemicflu.gov](http://www.pandemicflu.gov))
- Plan to care for sick family members



- Plan for how you might...
  - Work from home if possible
  - Care for children if schools close

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# NBSB

H5N1 Vaccine Strain	Clade	2004	2005	2006	2007	2008	Totals
A/VTN/1203/04	1	0.23	2.86	0.79		1.16	5.04
A/Indo/05/05	2.1			6.25	2.25	0.041	8.54
A/BHG/QL/1A/05	2.2				6.32		6.32
A/Anhui/1/05	2.3				2.56		2.56
<b>Totals Ag-Along Formulation (90 ug/dose)</b>		<b>0.2 M</b>	<b>2.9 M</b>	<b>7.0 M</b>	<b>11.1 M</b>	<b>1.2</b>	<b>22.5* M</b>
<b>Totals Oil-in-Water Adjuvant Formulation (7.5 ug/dose)</b>		<b>2.7 M</b>	<b>34.3 M</b>	<b>84 M</b>	<b>133.2 M</b>	<b>14.4 M</b>	<b>268.6 M</b>



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# NBSB Pre-pandemic Vaccination: Questions

**Policy Questions**

- Is it time to use some of the pre-pandemic H5 vaccine stockpile to immunize a population in advance?
- Who would the target population be? What might be an initial target?
- Should we develop the knowledge base to begin pre-pandemic vaccination if H5 steps up to a higher pandemic alert level?

**Science Questions:**

- Should we use an adjuvant? Which one? How many doses?
- How do we develop a safety monitoring system?
- What is a rational stepwise approach to evaluating safety and risk benefit over time?



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# Disaster Medicine and Public Health Preparedness

An Official Publication of the American Medical Association

[www.dmphp.org](http://www.dmphp.org)

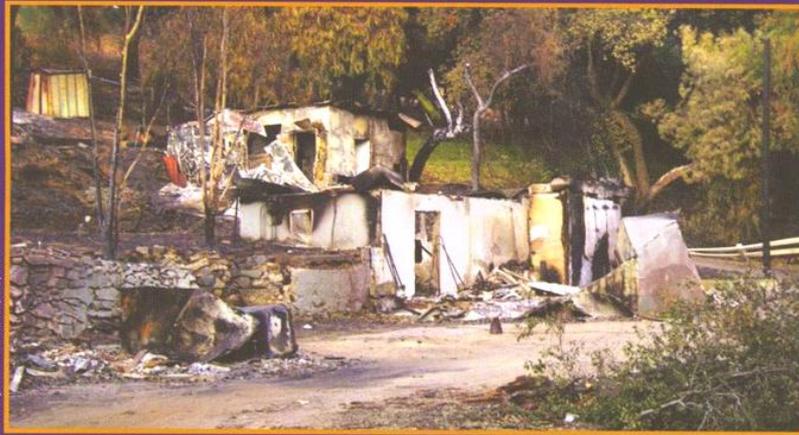


Photo by Thomas D. Krusch, MD, MPH

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