

The Mega-Flu Mess 1.0 (aka Avian Flu) as it appears in early October 2005

All or Most Countries

International Policy Aspects



Cause: NATIONS WILL LOOK OUT FOR THEMSELVES AND NOT THE INTERNATIONAL COMMUNITY. "The predictable news is that every vaccine-producing nation has just rationalized its supply to serve its own citizens first. The 'have-not' countries aren't going to get any vaccine." (This quote is from a scenario of hypothetical events that may take place in the future) Butler, Nature 5-26-05

Problem: COUNTRIES WITH LIMITED SUPPLY OF ANTIVIRAL DRUGS WON'T SHARE. "The politicians know that stopping the pandemic at source would be the best solution. But they're reluctant to donate drugs, as they'll have less for their own citizens if this approach fails." Butler, Nature 5-26-05 435/26

Data: U.S. HAS ENOUGH ANTIVIRALS FOR ONE PERCENT OF POPULATION "No point asking the United States - they've only got enough pills for 1% of the population." Butler, Nature 5-26-05 435/26

Data: EUROPEAN UNION HAS ENOUGH ANTIVIRALS TO COVER 30% OF POPULATION. "The situation is better in the European Union - they've got enough for a quarter of their population." Butler, Nature 5-26-05 435/26

Problem: COUNTRIES WILL CLOSE BORDERS, BUT THIS WILL NOT STOP THE FLU FROM SPREADING THROUGH ILLEGAL IMMIGRANTS. Leaders will try to stop the virus entering their countries by greatly reducing and even ending foreign travel and trade. N was seen in parts of Asia in response to the severe acute respiratory syndrome (SARS) epidemic. These efforts are doomed to fail given the infectiousness of the virus and the volume of illegal crossings that occur at most borders. But government officials will feel compelled to do something to demonstrate leadership. Individual communities will also want to bar Outsiders. Global, national and regional economies will come to an abrupt halt. Osterholm, Nature 5-26-05 435/26

National Policy Aspects



Problem: ETHICAL QUESTIONS OF DISTRIBUTION OF LIMITED SUPPLIES OF VACCINES, ANTIVIRALS AND PROTECTIVE EQUIPMENT HAVE NOT BEEN WIDELY AND PUBLICLY DISCUSSED OR DECIDED. "Ethical questions also need to be tackled now, in a public forum. Who will get the extremely limited antiviral drugs that will be available? Any priority setting during the crisis will provoke further dissent and disruption. Both government-sponsored and private health-care delivery systems have conducted little planning around this issue." In addition "who should receive the potentially life-saving products such as protective equipment, vaccines and antivirals have not been addressed on international, national, or local levels." Osterholm, Nature 5-26-05 435/26

Problem: PANDEMIC PREPARATIONS ARE STRICTLY NATIONAL. Although the pandemic will be global, defense plans are so far strictly national. Abbott, Nature 5-26-05 435/26

Problem: SOME COUNTRIES HAVE NOT APPROVED IMMUNE RESPONSE BOOSTING ADJUVANTS, IN VACCINES. "But most countries have not approved the use of adjuvants in flu vaccines, so they need to undergo additional testing - and that will take extra time." Check, Nature 5-26-05 435/26

Problem: GOVERNMENTS HAVE NOT DEVELOPED DETAILED BLUEPRINTS ON HOW TO OPERATE (I.E. DISTRIBUTE FOOD) DURING A PANDEMIC. "National, regional or local plans based on general statements of intent or action will be meaningless the face of a pandemic. Specific, operational plans that get through 12 to 36 months of a pandemic are essential. For example, determining how food might be supplied to local populations when transport and food processing plants shut down will require a level of planning not yet included in any national or regional plans." Osterholm, Nature 5-26-05 435/26

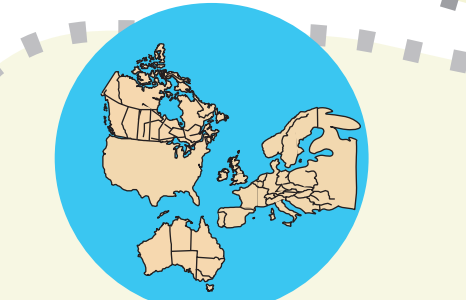
Problem: ESSENTIAL WORKERS HAVE NOT BEEN DEFINED "The WHO recommends that antiviral drugs should be available for the early treatment and prophylaxis of those groups at highest risk of infection and essential workers. But defining these people, and matching their number to the doses available, is difficult." Abbott, Nature 5-26-05 435/26

Problem: IN MANY COUNTRIES, NON-ESSENTIAL WORKERS WILL HAVE LITTLE OR NO PROTECTION AGAINST A PANDEMIC. "So the definition of essential workers will vary. Those deemed non-essential will be able to do a little but not a protective face mask - which provides no guarantee of safety." Abbott, Nature 5-26-05 435/26

Problem: IN NEAR FUTURE MOST PEOPLE WILL ONLY HAVE ACCESS TO A VACCINE DURING THE SECOND WAVE. "A vaccine cannot be delivered fast enough to prevent a virus outbreak in those countries where the pandemic first emerges. But by vaccinating people in many more countries we could minimize its impact." Osterholm, Nature 5-26-05 435/26

Problem: NO SURGE CAPACITY IN MEDICAL SYSTEM. Today, we have virtually no surge capacity for any consumer product or medical service that might be needed during the 12 to 36 months of a pandemic." Osterholm, Nature 5-26-05 435/26

Problem: ALMOST EVERYWHERE, QUANTITY OF PROTECTIVE EQUIPMENT, VACCINES AND ANTIVIRALS INADEQUATE. "protective equipment, vaccines and antivirals will not be available in sufficient quantities to contain and robustly mitigate first outbreaks in many developing countries." Osterholm, Nature 5-26-05 435/26



Rich Countries

Problem: RICH COUNTRIES WILL NOT SHARE VACCINES. Rich nations will not permit their vaccine supplies to be given to poor countries where the pandemic is likely to erupt. They will "watch pandemic rage through southeast Asia," and "they will hasten its spread across the globe." Check, Nature 5-26-05 435/26

Problem: G8 LEADERS HAVE FAILED TO SET UP GLOBAL FUND AND POLICIES TO HELP DEAL WITH AVIAN FLU. Fund would - improve outbreak surveillance - speed virus outbreak containment - stockpile antivirals and other medical supplies Policy would set in place decision-making procedures for responding to pandemic outbreaks.



Early Flu Transmission Countries

Problem: PUBLIC HEALTH SYSTEMS IN POOR COUNTRIES ARE DEFENSELESS, WITHOUT INTERNATIONAL FUNDS. "But bird flu is most rampant in poorer countries that do not buy a lot of flu shots. Although Vietnam and Thailand are planning clinical trials of influenza vaccines, the plans are preliminary. So there is a high risk that the countries at ground zero will be defenseless in the early days of a pandemic." Check, Nature 5-26-05 435/26

Problem: WORLD HAS INADEQUATE PLAN FOR GETTING ENOUGH VACCINE TO STOCKPILE OUTBREAK COUNTRIES. "Unfortunately, most industrial countries are looking at the vaccine issue through myopic lenses. The primary question seems to be: how do we get enough vaccine in the first months of the pandemic to protect our citizens?" Osterholm, Nature 5-26-05 435/26

Cause: POOR ASIAN INFRASTRUCTURE COMPOUNDS PROBLEMS OF VIRUS CONTAINMENT. "And given the poor infrastructure in many of the Asian countries in which a pandemic virus is most likely to arise, such measures might prove hard to implement in practice." Abbott, Nature 5-26-05 435/26

| How Many Might Die? | |
|---|-----------------------|
| Various estimates based on different assumptions | |
| Deaths worldwide | 2 million |
| 1957 flu pandemic mortality | 2 million |
| 1968 flu pandemic mortality | 0.7 million |
| 1968 extrapolated (by Stohr, WHO influenza chief) | 2 to 7.4 million |
| 1918 mortality | 7 to 100 million |
| Om's estimate | 325 million (maximum) |
| H5N1 mortality extrapolated 1918 extrapolated | 1 billion |

Modified from table by Davis, M. The Monster At Our Door, 2005, 125

Unknown: It is unknown why an H5 pandemic has not happened already. "When Newsweek asked a leading microbiologist whether a pandemic was possible, he replied, 'I don't think we completely understand why it hasn't happened already.' Indeed, there was a broad agreement among researchers that an H5 pandemic was not simply imminent, it was 'late'." Davis, The Monster At Our Door, 2005, 123

Unknown: It is uncertain whether a new pandemic can be tamed, when moving through huge slum populations. "Offered the unprecedented menu of huge slum populations, a new pandemic influenza might not be as easily tamed as its of ancestors. As Ewald explains, 'If predator-like variants of a pathogen population out-produce and out-transmit benign pathogens, then peaceful coexistence and long-term stability may be precluded much as it is often precluded in predator-prey systems.'" Davis, The Monster At Our Door

The Science of Vaccines and Antiviral Drugs

Problem: SCIENTISTS DO NOT HAVE ENOUGH FLU VIRUS DATA TO OPTIMIZE ANTIVIRAL DRUG TREATMENT. "Pharmacologists also want more biological data on patients who are treated with Tamiflu after being infected with the H5N1 virus now circulating in Asia. This will help them optimize dosing regimes. They complain that not enough is being done to gather these data from the relatively few patients who have so far been given the drug. Animal studies could also help, but this has similarly not yet been made an official priority." Abbott, Nature 5-26-05 435/26

Problem: STRATEGIES FOR FIGHTING THE VIRUS ARE BASED ON ASSUMPTIONS OF VIRUS BEHAVIOR, WHICH MAY PROVE WRONG. "Stish thinks the idea of ring-fencing outbreaks in this way is Orwell worth investigating. But Longini's model depends on assumptions about transmissibility and initial death rate that may prove to be wrong." Abbott, Nature 5-26-05 435/26



Problem: VACCINE MANUFACTURING CAPABILITY IS INSUFFICIENT FOR A GLOBAL PANDEMIC. "Even if the intellectual-property issues are resolved, it will be very difficult to step up global vaccine production to make enough to halt a pandemic... in a pandemic, we could need billions of doses [of vaccine]." Check, Nature 5-26-05 435/26

Vaccine Producers

Problem: RAPID, SURGE PRODUCTION CAPABILITY OF NEW VACCINE NOT IN PLACE. "We must demand nothing less than an international effort to develop a new type of influenza vaccine that can be manufactured on a much shorter time scale. This global vaccine will require a new method of production, surge capacity for crises and a detailed plan for distribution. One possibility is to move away from strain-specific vaccines towards generic vaccines that can respond to all virus strains." Osterholm, Nature 5-26-05 435/26

Problem: PHARMACEUTICAL COMPANIES ARE RELUCTANT TO INVEST IN VACCINES. Check, Nature 5-26-05 435/26

Problem: MANUFACTURING FLU VACCINES FOR HUMANS WITH REVERSE GENETICS NOT READY, LACKS GOVERNMENT APPROVAL. "No? Only a few? production lines have been set up for reverse genetic vaccine"

Cause: Side-effects can lead to lawsuits and bad press for vaccine manufacturers. "And vaccines are risky animals injected into a healthy person can end up doing more harm than good, leading to costly lawsuits and bad press." Check, Nature 5-26-05 435/26

Cause: LIMITED NUMBER OF CHICKEN EGGS. "At present, vaccine manufacturers have limited production capacity, which could be further constrained by the supply of lab standard fertilized chicken eggs." Check, Nature 5-26-05 435/26

New method of vaccine production using reverse genetics. Flu scientists have recently developed a new method of manufacturing flu virus in vats - a process that does not require chicken eggs.

Pharmaceutical Companies

The Virus Itself

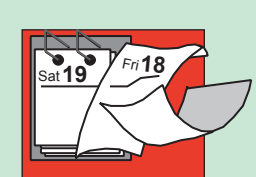
Data: Global outbreak could spread internationally, from one person, in one day. "The CDC would later construct a flow-chart of cases that originated from the Metropole Hotel: 195 in Hong Kong, 71 in Singapore, 58 in Vietnam, 29 in Canada, and 1 each in Ireland and the United States. As WHO Global Outbreak Alert and Response scientists later marveled, "A global outbreak is seeded from a single person on a single day on a single floor of a Hong Kong hotel." Davis, The Monster At Our Door, 2005, 11



Unknowns

Cause: The intrinsic biological uncertainty of a pandemic "But the biggest challenge to any plan is the intrinsic biological uncertainty: just how nasty will a pandemic virus be? O we have so many unknowns - about how many people of what age groups would get ill, just how ill they would get, just how fast the virus would transmit - so it is hard to be firm about the best strategy for prioritizing treatment groups. O Hayden says, Abbott, Nature 5-26-05 435/26

Data: Incubation period of 2 days (faster than SARS). Virus moves quickly through populations. "This flu moves much faster than SARS because its incubation period is just two days. People are spreading the virus the day before they get sick, and asymptomatic patients without even being visibly ill. Tamiflu needs to be administered within two days of anyone showing symptoms." Butler, Nature 5-26-05 435/26



Cause: The timing of a flu pandemic is highly uncertain. "What's more, a flu pandemic might never hit, so business leaders are reluctant to spend money on new factories that might never be used." "But retrofitting entire factories is an expensive business. O we are talking about a totally unpredictable, very rare event, so it's difficult to commit a company to these preparational approaches. O says Norbert Hehne, who manages GlaxoSmithKline's vaccine facility in Dresden, Germany." Check, Nature 5-26-05 435/26

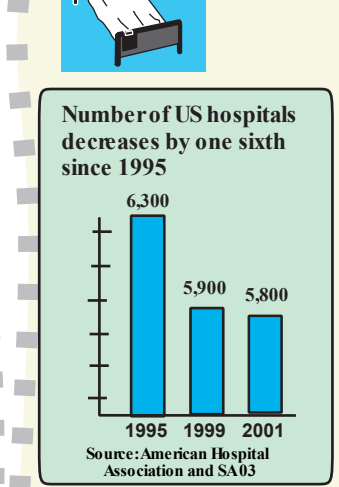
Antiviral Producers

Problem: ANTIVIRAL PRODUCTION CANNOT BE ACCELERATED VERY RAPIDLY. "Roche has promised not to profiteer by hiking prices during a pandemic, but it is not simply a question of money. The firm has no spare production capacity and batches take up to a year to make." Abbott, Nature 5-26-05 435/26

Cause: Antivirals are not very profitable. "The pharmaceutical company Roche didn't have huge commercial expectations for its influenza drug oseltamivir when it was licensed under the brand name Tamiflu in 1999. Flu is a way of life, and doctors have been advising aspirin, hot lemon and bed-rest for generations. In most countries they continue to do so, reserving the drug for vulnerable groups such as the elderly." Abbott, Nature 5-26-05 435/26

Data: Vaccines with immune-boosting adjuvants could be more successful at fighting Avian Flu. "Testing a vaccine containing an immune-boosting adjuvant might have allowed it to be diluted eightfold. Even with existing world production capacity, that would have let us produce 7.2 billion shots, enough to treat half the world's population. Now it's too late." Butler, Nature 5-26-05 435/26

Hospital Emergency Departments



Problem: HOSPITALS WILL BE COMPLETELY OVERWHELMED BY PANDEMIC. THERE IS NO SURGE CAPACITY. Hospitals are understaffed now. Especially emergency services which have been closing.

Hospital Critical Care Units operate with Est. 14.6% nursing positions unfilled (NYT/Mag 9/10/02)

Nearly 12% of urban hospitals are operating at overcapacity (NYT 4/9/02)

Crowding in emergency rooms forces 1 in 3 hospitals to direct ambulances elsewhere (NYT 4/9/02)

Between 1994 and 1999, more than 370 emergency departments were closed across the country at hospitals that were either closing or financially ailing about 4,200 are still open the number of emergency departments in rural areas dropped by 11% in the past decade (U.S. News & World Report, 9/10/01)

Local Communities

Problem: ON LOCAL LEVEL, MANY CITIES AND HOSPITALS HAVE NOT DEVELOPED ADEQUATE PLANS FOR EMERGENCY FLU RESPONSE. "As well as waking up to reality at the international level, we must also struggle with difficult issues at ground level. For example, there are no detailed plans in place to staff or equip temporary hospitals, which might be installed in high-school gymnasiums or community." Osterholm, Nature 5-26-05 435/26

Problem: RECRUITMENT AND TRAINING OF VOLUNTEERS TO PROVIDE SURGE CAPACITY FOR HOSPITALS HAS NOT BEEN DONE. "It is essential to think now about the possible use of lay volunteers in hospitals. N especially of those who survive the first wave of infection. Such survivors may have gained immunity before a vaccine has become available, and may want to assist clinicians. The strong medical arguments against using lay volunteers N grounded in both liability concerns and professional hubris N must be addressed." Osterholm, Nature 5-26-05 435/26

Data: In 2003-4, One-third of states cut back their public health budgets. 13 states had met federal guidelines for a pandemic plan. 20 states had no pandemic plan. "The Trust for America's Health was equally pessimistic. One-third of states had cut back their public-health budgets in 2003-4, and a majority were woefully unprepared to undertake high biosecurity lab work, to distribute vaccines, or to track outbreaks. Although "most public health officials call the emergence of a new lethal strain of the flu an 'inevitability,' only thirteen states had pandemic plans that met federal guidelines, while twenty states had failed to

Unmapped Territory

- China and other Asian countries
- Animal-human interaction
- Emergency planning

Transportation Sector

Communications Sector

Food Sector

Problem: IN AN EXTENDED EMERGENCY OVER SEVERAL MONTHS, SEVERAL COUNTRIES COULD BE NOT LEAVING HOMES. NO PLANS FOR RURAL FOOD DISTRIBUTION

Public Safety Sector

Public Health Sector

Education Sector

Problem: NO COMPREHENSIVE PLANS FOR DISTANCE LEARNING FOR ANY LEVEL OF EDUCATION.

Public Services Sector

Financial Sector

Public Utilities Sector