

STRATEGIC MEDICINE AND THREATS TO THE USA

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MILITARY MEDICINE IS MOSTLY OPERATIONAL

- **PROTECTION OF TROOP
ASSETS TO MAINTAIN THE
FIGHTING FORCE**
- **VACCINATION, PROTECTIVE
MEASURES, TREATMENT OF
DISEASE and INJURY**

Traditional Operational Diseases

- **Diarrhea**
- **Influenza**
- **Hepatitis**
- **Japanese encephalitis**
- **Malaria**
- **Dengue**
- **Typhus**



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UNITED STATES STRATEGIC COMMAND

THE MISSION OF STRATEGIC COMMAND

Deter major military attack on
the United States and its allies;
and if deterrence fails, employ
forces

DISEASE HAS MAJOR OPERATIONAL IMPORTANCE

- CAN DISEASE HAVE
MAJOR STRATEGIC
THREAT ??**
- CAN THE USA BE
MORTALLY WOUNDED BY
DISEASE ??**

WMD --- PROLIFERATION

- Easily Acquired equipment
 - Dual-Use Applications
 - Increasingly Hard to Distinguish from honest users
 - Research / development
- Info on the internet



NEW DISEASE THREATS WITH STRATEGIC IMPACT

- **HIV / Aids**
 - **Measles**
 - **SARS**
- **Tuberculosis**
 - **Avian Flu**

HOW EASILY CAN DISEASE SPREAD?

Import-Associated
Measles Outbreak—
Indiana, May-June
2005

MMWR. 2005;54:1073-1075

- **TEENAGER
WORKED AS
MISSIONARY**
- **WHILE FLYING
HOME GOT RUNNY
NOSE + FEVER**
- **ATTENDED
CHURCH SOCIAL
NEXT DAY**
- **34 CASES – 1 MED**
- **10% HOSPITALIZED**
- **INTENSIVE CARE**
- **“OPTED OUT OF
VACCINATION”**
- **530,000 CASES / YR**
- **BIG KILLER IN
REFUGEE CAMPS**

STRATEGIC MEDICAL THINKING

- ARE THERE CREDIBLE MEDICAL THREATS TO THE SAFETY OF THE UNITED STATES??**
- CAN DISEASES BE USED BY NON-STATE PLAYERS??**
- DO WE HAVE A STRATEGIC DEFENSE FOR THESE THREATS??**

THUNDER CRAP

响天雷

ART. NO. W573A (A) (烟花)
CONTENTS: 20/20/3 FIREWORKS

MADE IN GUANGXI CHINA

www.english.com

THREAT OF INFLUENZA

- **20% of world's population get it every year**
- **Half a million die yearly**
- **1918 epidemic killed more people than WWI – over 20 million**

INFLUENZA

- **RNA VIRUS – mutates frequently**
- **Spread through droplets and contact**
- **Avian flu strain thought to be related to 1918 variety**
- **NO IMMUNITY EXISTS**

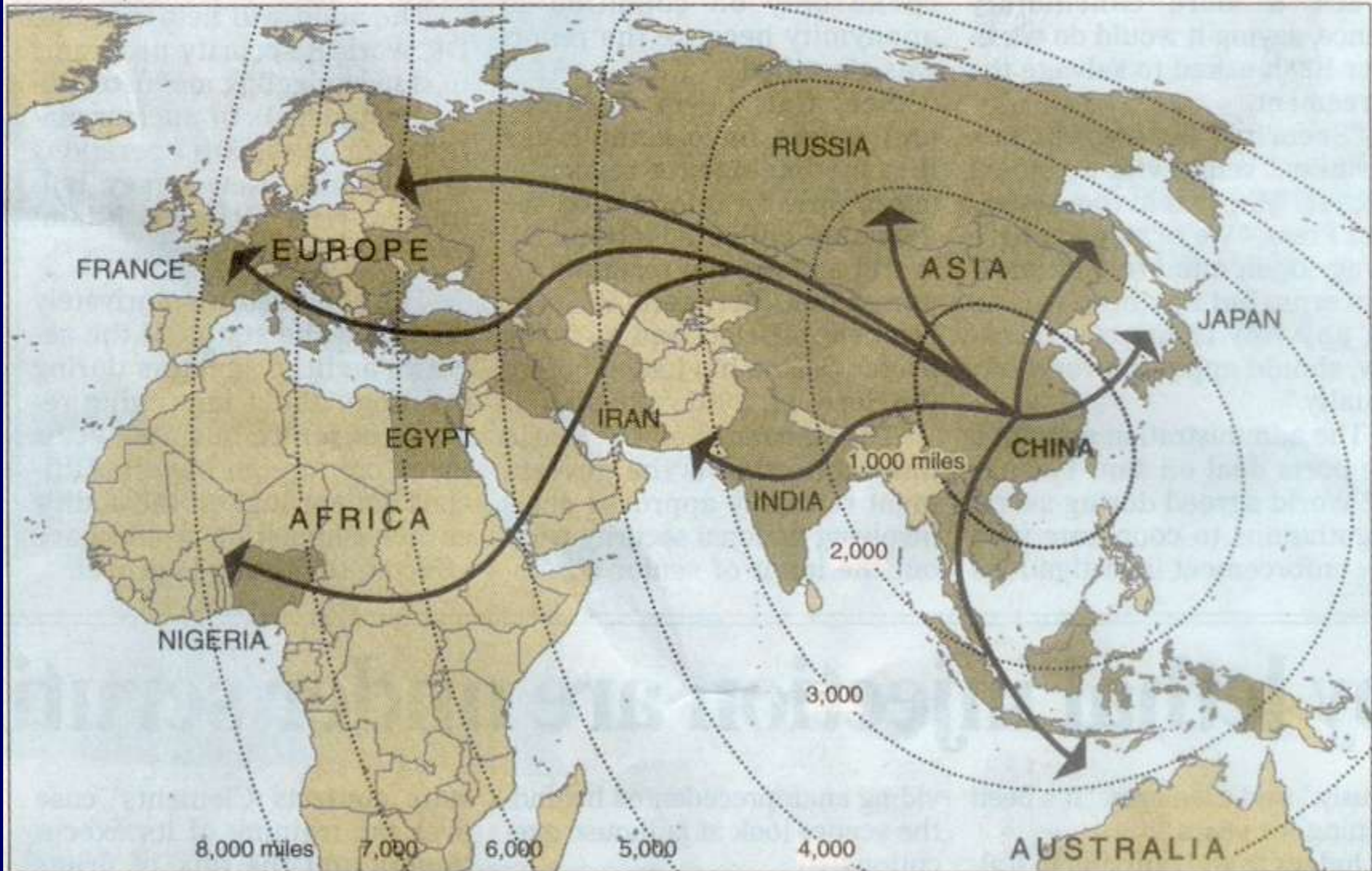
**CLOSE CONTACT BETWEEN
PEOPLE AND ANIMALS LEADS
TO A JUMP OF THE
INFECTION ACROSS THE
SPECIES**



Virus tracked outside of Asia

After its appearance, the current bird flu virus (H5N1) seemed confined to a few east Asian countries. In the past four months, it has moved into Europe and Africa. World health experts say the virus could change into a disease contagious to humans.

→ Expanding range of reported H5N1 outbreaks ■ Country with incidence of H5N1



**INDEX
CASE
HITS
USA**



DISEASE SPREADS RAPIDLY IN FLORIDA VULNERABLE Groups



Millions of chickens culled in Hong Kong

■ Avian flu sweeps 10 markets; the danger of mutated strains lingers

By Mark Landler
NEW YORK TIMES

HONG KONG — With chickens dying by the hundreds and public alarm mounting, Hong Kong on Friday ordered the slaughter of 1.2 million chickens and other poultry to halt the spread of a deadly flu virus.

The slaughter, which echoes Hong Kong's drastic response to a similar virus in 1997, will eliminate every chicken from the city's markets and all market-age poultry from its farms.

Hong Kong also halted the importation of live birds from mainland China, which supplies much of its poultry and so far has taken no action against the virus.

Lily Yam, the secretary for the environment and food, said that unlike the previous virus, which killed six people, there is no evidence that this strain affects human beings.

But it has killed nearly 1,000 chickens in seven markets over the past week, prompting the government to take what it called

comprehensive measures.

On Wednesday, after scientists at the University of Hong Kong detected a recurrence of the avian flu, the city shut down three markets and slaughtered 6,600 chickens.

But chickens in other markets fell ill, and further tests showed that the virus had spread to 10 markets.

"We are dealing with an acute and virulent virus," Yam said. "The bird flu is spreading rapidly. If we do not take speedy action, it is difficult to predict how this will develop."

In late 1997, Hong Kong killed 1.4 million birds — said to be every chicken in the territory — in an effort to stamp out a strain of avian flu.

The campaign put an unwelcome spotlight on Hong Kong six months after its return to Chinese sovereignty, but succeeded in containing the virus.

Since then, Hong Kong has inspected markets for signs of a recurrence of the virus, known as H5N1. In February, officials found an H5N1 virus similar to the current one.

But until this week they had not found a strain that killed

TREATMENT
IS LIMITED

VACCINES
OF LIMITED
VALUE + HARD
TO MAKE

CONTAINMENT
VIRTUALLY
IMPOSSIBLE

**AVIAN FLU MEANS
SLAUGHTER THE
CHICKENS EN MASSE**

**NO CHICKENS -- MEANS
NO CHICKEN NUGGETS
NO CHICKEN SOUP**

**WHAT WILL
REPLACE
CHICKEN
SOUP??**

**THE GALLEY
WILL FIND
SOMETHING
GOOD FOR
YOU**



CHICKEN RANCHERS AND KFC =





IMPACT OF A SIMPLE NAME AND VIRUS

TB case prompts questions; Patient sidestepped federal safeguards

- **Copyright 2007 Chicago Tribune Company**
- **June 1, 2007**
- **DENVER — In a time of widespread worry over pandemic flu and bioterrorism, the case of Andrew Speaker offered a prime chance for international health agencies to show how they would prevent the spread of a potentially deadly disease.**

Tuberculosis Spreads Through Crowded City Buses, Cornell Researcher Reports

- *Science Daily* -- February 1, 1999

The crowded metropolitan bus system in Buenos Aires could be responsible for 30 percent of new cases of tuberculosis in the city, a new study shows.

THE RISK ??

- **Because of antibiotics and other measures, the TB rate in the United States has been falling for years. Last year, it hit an all-time low of 13,767 cases, or about 4.6 cases per 100,000 Americans.**

Tuberculosis kills nearly 2 million people each year worldwide.

ARE THERE other DISEASE THREATS WE SHOULD FOCUS ON??

- **CAN THE USA BE HARMED BY
SIMPLE TOOLS THAT DO NOT
REQUIRE SOPHISTICATED LAB,
RESEARCH, OR DELIVERY
SYSTEMS ??**

WHERE'S THE BEEF?

There's plenty of room for all God's creatures.
Right next to the mashed potatoes.



SASKATOON
STEAKS • FISH • WILD GAME
477 HAYWOOD ROAD

FAIRWAY

BEEF INDUSTRY

- **800,000 ranchers and cattlemen in USA**
- **2004 CASH RECEIPTS = \$45.6 billion**
- **Jan. 1, 2005 -- 108 million cattle in the USA**

PORK INDUSTRY

- **60 million animals in USA**
- **2 BILLION LBS/YR
EXPORTED**
- **\$12,000 Million sales
projected in 2005**

Tests affirm first case of mad cow disease

MADRID, Spain — The government reported Spain's first case of mad cow disease on Wednesday and said it is investigating a second possible case.

Tests by government veterinarians in the northwest Galicia region revealed a confirmed case of bovine spongiform encephalopathy, or BSE, late Wednesday morning, Agriculture Minister Miguel Arias Canete said. He said Spanish authorities sent samples of the second animal to British experts for further analysis.

"The first case is conclusive. There is no room for doubt," Arias Canete said.

BOVINE SPONGIFORM ENCEPHALITIS

- **MAY HAVE DERIVED FROM
INGESTION OF NERVOUS
SYSTEM PARTS**
- **RELATED TO SCRAPIE IN
SHEEP**
- **NO TREATMENT**

MAD COW DISEASE

- **COULD INFECT THE US BLOOD SUPPLY**
- **COULD DESTROY THE BEEF INDUSTRY**
- **ALREADY HAS HAD SIGNIFICANT ECONOMIC IMPACT**

MAD COW DISEASE

- **JACOB-CREUTZFELD OR KURU**
- **BOVINE SPONGIFORM ENCEPHALITIS -- BSE or vCJD**
- **Prion which is passed through meat products, blood transfusion, and contact**
- **Not destroyed by standard operating room sterilization !!!**
- **Slow nervous system degeneration**

HOW MAD COW SPREADS



1 Mad cow disease, or BSE, may have come from sheep with a brain disorder called scrapie, or it may have arisen spontaneously in cows

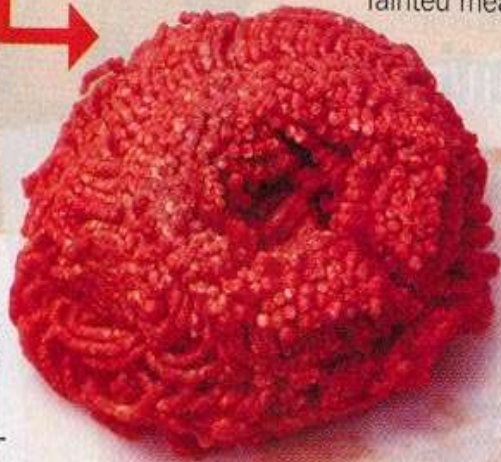


2 Infected sheep and cows were rendered into feed for cattle, passing the disease from one animal to another



Cow with BSE

3 While the disorder strikes primarily the brain and the rest of the central nervous system, these tissues may have contaminated other parts during slaughtering and thus entered the human food supply



Tainted meat



TIME Diagram by Joe Lertola

As a result, not one cow in America has so far been found to have BSE—and the U.S. Department of Agriculture has an aggressive plan to find, quarantine and destroy any if they appear. “Even if you do eat beef from an infected cow,” says Michael Scott, a mol-

might cause at least a few deaths before anyone could stop it.

With the U.S. government’s stringent import regulations, the BSE prion is un-

too developed the disease (although cows that merely ate elk meat did not). Last

GROUND BEEF: ENVISION

Deaths from rare disease worry Colorado hospital

ASSOCIATED PRESS

DENVER — Two patients have died at a Colorado hospital this year from Creutzfeldt-Jakob disease, an illness similar to mad cow disease, and there is concern that other patients may have been exposed, a hospital spokeswoman said Friday.

The patients, both over 60, died in January and February at Exempla St. Joseph Hospital, said Steve Krizman of Kaiser Permanente, the health maintenance organization that cared for them.

Hospital official Kathleen Ferguson said at least six other patients may have been exposed to Creutzfeldt-Jakob through surgical instruments used in treating one of the two who died.

The instruments were sterilized after each use, but no studies have

been done to show whether sterilization procedures are effective against the proteins that cause the disease, said Dr. Cathy van Blerkom, chairwoman of the hospital's Department of Pathology and Infection Control.

Creutzfeldt-Jakob disease, or CJD, attacks the brain, killing cells and creating gaps in tissue. The brain takes on a spongelike appearance.

Symptoms include memory problems, mood changes and lack of coordination. The disease progresses to shakiness and dementia. Victims are eventually unable to move or speak.

"We had four cases in 2000 and two or three a year before that," said Cindy Parmenter of the Colorado Department of Public Health and Environment. "It's not totally unusual."



FDA Ponders Products to Avoid Prion Transmission

BY CHRISTINE KILGORE
Executive Global Medical News

GAITHERSBURG, Md. — Concern about the possible spread of transmissible spongiform encephalopathy through contaminated surgical instruments has prompted the Food and Drug Administration to consider how best to evaluate new products designed to reduce infectivity.

The FDA has not yet received such products for premarket evaluation. But advances in research on transmissible spongiform encephalopathy (TSE) and infection control, and a rise in concern about bovine spongiform encephalopathy and an unknown prevalence of asymptomatic variant Creutzfeldt-Jakob disease, has the FDA anticipating such products will be coming.

The FDA's General Hospital and Personal Use Devices Panel told agency officials in September that they should be able to reasonably validate a claim for "reducing TSE infectivity" by using prions derived from animals. The panel cautioned, however, that research should use human prion sources as much as possible, as well as instrument "proxies" that replicate surgical instruments more closely than the tiny stainless steel wires coated with inoculum that are used in current studies.

Surgeons, meanwhile, are eager for new products or processes that are "less burdensome" than the procedures many hospitals now follow for preventing iatrogenic TSE transmission, said John Conte Jr., M.D., a surgeon who spoke during the public comment session of the meeting.

Current practice is to throw out items suspected of TSE contamination. "It's fair to say that major medical centers are attempting to identify patients with possible prion disease, and then are discarding neurosurgical instruments" after an operation, said Dr. Conte of the department of hospital epidemiology and infection control at the University of California, San Francisco.

The FDA has estimated a risk of 0.25 iatrogenic infections a year in patients undergoing neurosurgery with reprocessed neurosurgical instruments. But this estimate does not take into account a possible undetected incidence of variant Creutzfeldt-Jakob disease or the evidence that transmission may involve many types of nonneural tissues, meeting participants said.

"It's difficult to fathom what the real risk is," said panel chair Charles E. Edmiston Jr., Ph.D., of the department of surgery at the Medical College of Wisconsin, Milwaukee. The true risk, he explained, is "a moving target."

TSEs are progressive, fatal neurodegenerative diseases, affecting both humans and animals, that result from accumulation of an abnormal isoform of a prion protein. The estimated annual incidence in the United States of Creutzfeldt-Jakob Disease (CJD), the major form of human

TSE, is one case per million, FDA officials said at the meeting.

Most cases of CJD are sporadic, or idiopathic, and some are familial. But variant CJD—CJD caused by cross-species transmission—is heightening the FDA's interest in the transmission potential of prions. In a background paper, the FDA referred to the epidemic of bovine spongiform encephalopathy in the United King-

dom and said that surveillance for variant CJD has identified 141 cases since 1994. "Although the number of cases of variant CJD reported annually is now declining, CJD can have a very long incubation period,"

the paper said. "It is possible that the incidence of variant CJD may increase again in future years."

One patient—a U.K. emigrant—has developed variant CJD in the United States, FDA officials said at the meeting. (Two cows infected with bovine spongiform encephalopathy have been identified in the United States so far; both were born in Canada and did not enter the food supply.)

The only reported cases of CJD transmission by contaminated surgical instruments—seven in all—came from Europe between 1954 and 1980. Five of them involved neurosurgical instruments, and two involved depth EEG electrodes.

Another approximately 260 cases of iat-

trogenic CJD transmission were reported in patients receiving corneal transplants, dura mater grafts, gonadotropin, and, most frequently, human pituitary growth hormone. One or two cases of CJD from blood transfusions have also been reported, said Sheila Murphy, M.D., chief of the FDA's Infection Control Devices Branch.

Guidelines from the Centers for Disease Control and Prevention and the World Health Organization state that precautions should be taken for invasive CNS procedures in patients with dementia of uncertain origin and patients known or suspected of having TSE.

The CDC-WHO guidelines recommend discarding surgical instruments, quarantining them until a diagnosis is confirmed, or treating them with one of three processes shown to have some effect in reducing TSE transmission: immersion in sodium hydroxide, prevacuum steam sterilization, or gravity steam sterilization.

But as Dr. Conte and others at the meeting see it, efficacy of the treatments is not backed by sufficient evidence, the treatments are too corrosive, and sodium hydroxide is too toxic for hospital use.

Industry representatives told the FDA panel that human CJD prions appear in new research to be significantly more resistant to sterilization procedures than the animal-derived prions used in almost all studies to date. Still, the industry officials said, disinfectants being tested—such as acidic sodium dodecyl sulfate—may prove effective in eliminating human prions from surgical instruments. ■

THE EFFICACY OF THE TREATMENTS IS NOT BACKED BY SUFFICIENT EVIDENCE AND THEY ARE TOO CORROSIVE.

CATASTROPHIC EFFECTS of INFECTED LIVESTOCK

- **Beef exports during January-September 2004 totaled 293 million pounds, 15 % of exports for the same period a year prior**
- **Mexico and Canada were the only two major markets to permit U.S. beef shipments the first three quarters of 2004.**

THERE GOES STEAKS



WALL STREET JOURNAL

SATURDAY AUGUST 4, 2007

- BRITAIN IMPOSED a voluntary ban on exports of livestock and livestock products after an outbreak of foot-and-mouth disease in southern England. Premier Brown said authorities were working to track the source of the outbreak

HOOF + MOUTH

- **Picornovirus**
- **Breath, saliva, feces, and urine; milk and semen**
- **Meat and by-products**
- **No real treatment**

HOOF AND MOUTH DISEASE

- **HIGHLY CONTAGIOUS**
- **EFFECTS Cattle, Sheep, Swine, Camels**
- **NOT SEEN IN US IN MANY YEARS**
- **Endemic in ASIA and Mideast**
- **COULD DEVASTATE THE
AGRICULTURE INDUSTRY AND
RELATED ECONOMIES**

HOOF AND MOUTH

- **DELIVERY SYSTEM CAN BE BY HAND OR MAIL – NO MISSILE NEEDED**
- **VIA CONTAMINATED PRODUCTS – Leather, meat....**



HOOF AND MOUTH = CONTAINMENT

- **QUARANTINE AND
SLAUGHTER HERDS WHEN
A CASE APPEARS**
- **COULD WIPE OUT \$100
BILLION BEEF INDUSTRY**
- **PORK, SHEEP ETC**

CATASTROPHIC EFFECTS

- **QUARANTINE AND HERD
SLAUGHTER**
- **100 MILLION CATTLE +
60 MILLION HOGS**
- **DEVASTATE THESE INDUSTRIES**
- **RIPPLE EFFECT CATASTROPHIC --
RESTAURANTS, FAST FOOD,
GROCERY, EXPORT MARKET**



**WATCH
BEEF
AND PORK
INDUSTRY
FALL**

FAMOUS STEAK RESTAURANTS AND BARBECUE JOINTS MUST CHANGE MENU AND NAMES

If you worked here - How would you answer the phone?





PROBLEMS

NO MATTER HOW GREAT AND DESTRUCTIVE YOUR PROBLEMS MAY SEEM NOW,
REMEMBER, YOU'VE PROBABLY ONLY SEEN THE TIP OF THEM.

VACCINES

- **26 US COMPANIES MADE VACCINES IN 1950'S**
- **ONLY 4 US COMPANIES IN 2004**
- **VACCINE INDUSTRY WORTH \$ 6.7 BILLION**
- **OUTSTANDING LAWSUIT CLAIMS EXCEED \$ 30 BILLION**

WHERE DO OUR VACCINES COME FROM??

- **Hemaphilus Influenza**
- **DTAP (diphtheria, tetanus, pertussis)**
- **SKB HEPATITIS A**
- **INFLUENZA**
- **TETANUS –**
- **MOST ALL ARE FROM FRANCE**

ARE WE PREPARED??



VACCINE MANUFACTURE

- **REQUIRES ENORMOUS EXPENSE**
- **REQUIRES FASTIDIOUS TECHNIQUE**
- **OFTEN TAKES 6 MONTHS ON THE PRODUCTION LINE**
- **VIRUSES CAN BE ENGINEERED TO RESIST CURRENT VACCINES AND MEDICINES**

CONFLUENCE OF EVENTS

- **PANDORAS BOX OF BIO HAZARDS IS OPEN**
- **More Diverse, Less Predictable Threats**
 - **non-state players, readily accessible tools**
- **Evolve Strategic Thinking Beyond Nuclear Weapon Deterrence – index patient can deliver the strike**
- **Shape Strategic Force for 21st Century – industrial capacity for disease fight**
- **Food, water safety, and disease spread are our major vulnerabilities**
- **Economic Devastation can result from accidental or intentional spread of disease**

STRATEGIC IMPACTS IN DISEASE SPREAD

- **WHAT WOULD A SERIOUS
INFLUENZA OR SARS
OUTBREAK DO TO ECONOMY
AND INDUSTRY?**

Avian flu pandemic could cause recession, report finds -- Dec 9 2005

WASHINGTON - A severe avian flu outbreak would cost the U.S. economy \$625 billion -- about 5 percent of the gross domestic product -- as employers struggled with absenteeism, lost production and a sharp decline in consumer spending, a new government report has found..

The estimates are based on a pandemic that would sicken 90 million people in the United States and kill about 2 million. KNIGHT RIDDER

HOW TO OBTAIN INFO

- WWW.CDC.GOV
- WWW.CIA.GOV
- WWW.FDA.GOV -- for BSE info
- WWW.ERS.USDA.GOV
- AFMIC – 301-619-7574

COULD WE HANDLE AN OUTBREAK ??

- COULD WE QUARANTINE
PEOPLE LONG ENOUGH TO
DEVELOP VACCINES??**
- DO WE HAVE INDUSTRIAL
CAPACITY OR ADEQUATE
STORAGE OF ANTIVIRALS ??**

WHERE IS OUR INDUSTRIAL VACCINE SURGE??

- WE HAVE LIMITED INDUSTRIAL CAPACITY TO MAKE VACCINES**
- WE MIGHT HAVE TO RELY ON FOREIGN PRODUCTION**
- VACCINES TAKE A LONG TIME TO MAKE**

PROJECT BIOSHIELD

- In 2004, US funded with \$5.6 Billion
- To create drugs and vaccines to protect USA from bioterrorism or epidemics
- As of Feb 2007, no new drugs or vaccines have been produced (JAMA Feb 14, 2007)
- VAXGEN in Calif got \$877.5 Million for 75 mil doses of anthrax -- cancelled

**WHAT WOULD HAPPEN TO
AGRIBUSINESS, THE
RESTAURANTS, THE MARKETS
IF HOOF + MOUTH OR BSE GET
LAUNCHED ??**

**CAN WE AFFORD
\$200 A POUND FOR HAMBURGER
OR \$25 FOR MILK ??**



I BEAT
ANDREXIA

BE THE TRESH

QUESTIONS ??

WHY WORRY??

- SHOULD AIRLINES ALLOW SICK PEOPLE TO FLY ??
- DO WE NEED VIGOROUS PRE-EMPTIVE DISEASE SCREENING AT TSA and IMMIGRATION ??

PERSONAL READINESS

- **ARE YOU AND YOUR FAMILY READY TO BE QUARANTINED IN YOUR HOME FOR A MONTH ??**
- **DO YOU HAVE FOOD, WATER, EMERG POWER??**