

Disease and Globalization: On a Fast Track

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EXECUTIVE SUMMARY

While epidemics have been around for as long as humanity's existence, their spread was once held in check by geography. However, the proliferation of high-speed global transport of people and livestock has opened the floodgates for disease transmission. Private business must find its role in responding to disease outbreaks.

12 TRENDS changing the world

A five-year research project reveals that the future of commerce worldwide will be greatly influenced by a dozen "global tectonics" that will affect business leaders across all industries:

1. Biotechnology
2. Nanotechnology
3. Information technology
4. Population
5. Urbanization
- 6. Disease and globalization**
7. Resource management
8. Environmental degradation
9. Knowledge dissemination
10. Economic integration
11. Conflict
12. Governance

In this era of globalization, infectious disease thrives along with cross-border integration — including the movement of goods, labor, and transportation. Health and security have become key areas of both business and government observation. The international community already contends with viruses such as HIV, malaria, SARS, and tuberculosis. As the world becomes more integrated, companies, governments, and individuals are faced with the challenges and opportunities that disease presents.

Epidemics take their tolls on societies in a variety of ways: loss of life, political instability, and economic stagnation accompany epidemics sweeping the world today. In the face of these health crises, governments and corporations must respond quickly and effectively or risk losing citizens, workers, and consumers.

How epidemics begin and spread

Epidemics and the diseases that cause them are not new. Diseases have decimated the populations of every continent. In the 1300s, the bubonic plague, or Black Death as it was commonly known, swept through Europe, killing up to 30 percent of the population. Arriving in 1346, most likely due to new trade patterns and army

movements, the plague moved quickly through Europe over the next four years. Business leaders must recognize the awesome impact disease can have on a stable world. The ruling class of the Middle Ages did not take into account the possibility of a disease drastically altering the fabric of their society. Today's business leaders can learn from that mistake. Europeans did not track the movement of the plague; they were unaware that trade was facilitating the development of the disease.

Now, technology enables epidemiologists to study the movement of disease almost to the person. More is known about transmission modes, incubation periods, and the contagious nature of diseases. The World Health Organization and many governments have come together to monitor, track, and prevent epidemics before they reach the level of the Black Death.

However, with new technology comes a new challenge. We must contend with the speed at which people and goods move around the planet. Planes, boats, high-speed trains, trucks, cars, and every other type of transportation can move anything anywhere at breakneck speed. This means that diseases no longer take years to reach new geographic areas. Pathogens can arrive within

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with relatively severe outbreaks in Toronto, Taiwan, and Beijing. As global health organizations struggled to identify and contain the virus, SARS grounded airlines, hurt businesses, and even caused riots in China.

Because trade and travel now link so many societies, SARS-like epidemics and their human and economic consequences can no longer come as a surprise. Businesses must be able to adapt quickly to changed market conditions brought about by such epidemics.

The stakes associated with this tectonic force are high. Infectious diseases kill millions of people every year and, as the SARS virus demonstrated, can quickly generate economic turmoil on a global scale. The global economic impact of SARS was estimated at \$30 billion, with an estimated \$12.3 billion in losses in Asia alone.

Countries need a global health infrastructure that responds quickly and effectively to epidemics such as the avian flu, SARS, or terrorist-induced disease outbreaks. In this era of increased economic and social integration, an outbreak in one country can develop into a global pandemic in a matter of days. As a result, governments, non-government organizations, and private companies must devise health care solutions that cross borders as effectively as the infectious agents they work to contain.

Disease and society

Infectious disease significantly affects economic growth and development, especially in countries with high disease burdens. In many developing countries, HIV/AIDS has decimated the labor force and overwhelmed already struggling education and health care systems. The catastrophic effects will burden those countries for generations to come.

Terminology

An epidemic is a sudden severe outbreak of disease within a region or group. A pandemic occurs when an epidemic becomes widespread, affecting a whole region, a continent, or the entire world.

Source: MedicineNet.com

hours. Travelers, business people, tourists, diplomats, and reporters become innocent transporters of deadly diseases.

As populations continue to interconnect, the likelihood of epidemics and pandemics of infectious disease increases. Compared to the plague, which took four years to spread, SARS originated in China and spread rapidly to 30 countries within weeks,

movements, the plague moved quickly through Europe over the next four years. The plague was a factor, at least in part, for altering the makeup of society. The massive loss of workers caused the demise of the feudal system, and the Renaissance was born. This story of epidemic and economic recovery is repeated over and over in the history of humanity.

Local disease, global implication

“Despite some alarming trends, the infectious disease situation ... is largely encouraging, sometimes in ways that suggest a fundamental change for the better in the landscape of public health. The world is on guard as never before. The threat posed by infectious disease is now perceived to be universally relevant, as the speed and volume of international travel have made an outbreak or epidemic anywhere in the world a potential threat everywhere else. Moreover, the ability of infectious diseases to destabilize societies, so alarmingly demonstrated by AIDS, has brought home the message that local infectious disease problems can have global security implications.”

— World Health Organization

While the world struggles to prevent new outbreaks, current diseases continue to spread. AIDS, tuberculosis, and malaria kill approximately 6 million people a year, which is about 16,000 people a day. The spread of these preventable diseases takes its toll on the countries where they occur and generally correlate to a low

opened public health services record the highest infection rates. Of the 42 million people now diagnosed with AIDS worldwide, for example, 95 percent live in the developing world — with Africa and India reporting the majority of new cases.

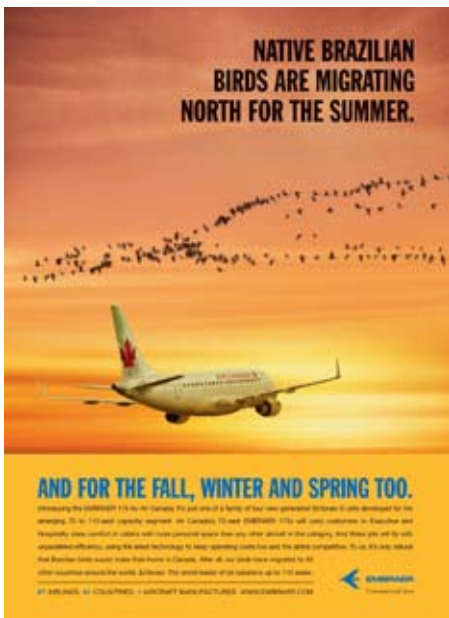
Pre-emptive spending on diseases should prove beneficial to businesses,

Local diseases are now global

Because people now move freely about the planet, we must prepare ourselves for diseases to which our bodies have not developed immunity. It is not just humans who relocate: Diseases invariably tag along.

Billions of dollars have been earmarked by the United States to combat an Asian disease that has killed two dozen people halfway around the world.

As current epidemics are fought, new ones arise daily. It is feared that the next SARS-like outbreak is already underway in the form of avian flu. Dozens of people have already died from the avian flu virus (H5N1), which continues to be discovered in new countries. The World Health Organization and America's Center for Disease Control and Prevention are now becoming concerned about a flu pandemic like the 1918 outbreak in Spain that killed more than 20 million people. Given travel and urban overcrowding, the



Airlines and aircraft makers tout their long-range capabilities: good for travelers, but also good for spreading disease globally.

level of public health and a high level of poverty. Governments must contend with these two problems in their efforts to stop infectious disease.

It is important to note that those countries with the most underdevel-

offering the twofold benefits of making money on infrastructure efforts and saving money by diverting problems. Businesses should encourage governments to build disease prevention infrastructure.

disease is unlikely to stay in one country or area should an outbreak occur. Billions of dollars have been earmarked by the United States to combat an Asian disease that has killed two dozen people halfway

Whose problem is it?

In a World Economic Forum survey of 8,000 companies, 47 percent of firms believe that AIDS is having or will have an impact on their business. Only 3 percent of the same companies polled were satisfied with their company's response to date. Many companies still cling to the belief that AIDS is not their problem.

Source: The Global Business Coalition on HIV/AIDS.

around the world. This is but one of many steps the world needs to take to fight against current and developing diseases.

Before indigenous diseases move to new and unconquered lands, the best treatment is still often local. Frequently, it is the local medical community that is the most adept at identifying and treating something they are familiar with.

This need for local knowledge in non-local places is crucial in the fight against disease. As the United States government has realized this, so must businesses.

Northrop Grumman Information Technology is one of at least eight companies and academic institutions that have been contracted by the United States National Institute of Allergy and Infectious Disease (part of the National Institutes of Health) to compile a database of six known pathogens.

These six pathogens will become part of a centralized, consolidated information set for scientific researchers. Because the bulk of information is being created at research institutions, it is difficult to avoid data replication, a costly and unnecessary process. The goal is for this database to eliminate that problem as well as make local knowledge accessible to the global community.

Current plans are that the database will be designed such that additional pathogens can be added. Current costs for the task, all of which are being paid by the U.S. federal government, are estimated at upwards of \$83 million. Jobs similar to this one are sure to emerge at a rapid pace

as more governments, non-government organizations, and international members of civil society follow the lead of the United States.

Epidemics

In sub-Saharan Africa, 25 million to 28 million people live with AIDS. By 2010, this region will no longer rank as the most HIV-infected region: China, Ethiopia, India, Nigeria, and Russia will become the new centers of the AIDS epidemic. Cumulatively, these states are trying to support between 14 million and 23 million people living with AIDS, numbers that will increase to 75 million people by 2010. These infection rates will reduce productivity, gross domestic product, and foreign direct investment. Today, the AIDS epidemic rages in many developing countries that must also

Help from business

"Business brings with it qualities that can turn the tide of the epidemic. The entrepreneurial spirit and problem-solving expertise that the private sector brings to the table means that most companies operate with a core set of skills that can be leveraged to positively impact the epidemic. Efficiency of operations, overcoming obstacles, responsibility for achieving concrete outcomes, and accurately gauging perceptions and human behavior help business to thrive and are prerequisites for success in battling the pandemic locally, nationally, and internationally."

— World Health Organization

contend with malaria, yellow fever, and dengue fever. Together, these diseases have already orphaned millions of children, discouraged foreign investment, and impaired the health-care infrastructure.

Government response

Chinese leaders are taking steps to fight the rising HIV/AIDS epidemic that experts predict in their coun-

try. President Hu Jintao and former President Jiang Zemin met with former U.S. President Clinton in New York recently to discuss means for stopping AIDS. China is the only country with 1 billion people, and half of them have never heard of AIDS. The Chinese government is hoping to prevent the spread of HIV/AIDS before it develops into the epidemic proportions already seen in other parts of the world.

The threat of infectious disease in a tightly connected international system is prompting greater cooperation and communication on issues previously deemed too sensitive to report or discuss.

Corporate response

Hank McKinnell of Pfizer was the only drug company CEO to attend the International AIDS Conference during the summer of 2004 in Bangkok, Thailand. Often criticized for high-priced drugs and opposition to generic knockoffs, Pfizer is addressing the AIDS epidemic as more than an opportunity to donate free medication. However, McKinnell contends that

for Pfizer to continue its research and donations to the Third World, developed countries must continue to pay market prices for drugs.

Pfizer is helping build the necessary infrastructure to fight against infectious diseases. In the face of an epidemic such as AIDS, which often times feels too large to control (or for that matter, understand), the steps being taken are extraordinary. On

Oct. 20, 2005, the Infectious Diseases Institute was opened in Uganda as a result of the remarkable coming together of The Pfizer Foundation,

States recently vaccinated their military personnel. Following the Sept. 11 terrorist attacks and the subsequent release of anthrax through the United

Greater global risk leading to greater collaboration

A new trend in funded research is arising, pushed forward by such power players as the Juvenile Diabetes Research Foundation, the Michael J. Fox Foundation for Parkinson's Research, and the newly founded Myelin Repair Foundation for multiple sclerosis research. This trend is one of information sharing as opposed to the age-old information hiding.

Makerere University in Uganda, Pangaea Global AIDS Foundation, the Academic Alliance Foundation for AIDS Care and Prevention in Africa, and the Infectious Diseases Society of America. The IDI hopes to treat 300 patients a day and 10,000 patients a year, putting as many as needed on antiretroviral drugs.

IDI also plans to train 250 AIDS specialists a year who will be able to work in rural conditions and train others. Merle Sande of the Academic Alliance Foundation summarized the program as follows: "The IDI reflects true partnerships between academicians in North America and Africa and the public-private sectors who have come together to build infrastructure to combat the most threatening disease to attack mankind."

Terrorism

As the global community contends with naturally created disease, there are those attempting to harness the power of epidemics for destructive purposes. Threats of bioterrorism and contamination of food and water supplies haunt global leaders and the public.

Smallpox is a case in point. Because many countries stopped their smallpox vaccination programs in the 1970s, a biological attack with this potential terrorist weapon would create a humanitarian disaster. In light of this threat, Israel and the United

States postal system, many countries now work to prevent terrorist groups from gaining access to dangerous bioagents. Infectious disease has become an issue of national and international security for the entire global community.

The fight against bioterrorism is going to be a more different war than has ever been fought before: one to be fought at the cellular level. This cellular-level fight will be a battle of information and containment; this is where business can play a role.

Opportunity, disease, and change

What should businesses be doing to prepare for contingencies arising from natural or deliberate epidemics and disease-related volatility? First, they need to engage in scenario-analysis to begin to define their reactions in the event of an epidemic. Second, they should assess the extent to which international and national institutions are prepared for such contingencies — especially because public-private sector partnership is critical to defining and implementing solutions. Third, the growing threat of bioterrorism suggests new possibilities for the private sector to marshal its resources and technological innovation in support of new biodefenses and procedures.

Traditional medical research takes place at one laboratory with one team taking credit for patents and discover-

ies. Information is kept private while the proprietary information can be published.

By contrast, the Myelin Repair Foundation was started by Scott Johnson, a Silicon Valley executive who was diagnosed with the degenerative disease myelin at the age of 20. Johnson distributes money only to researchers who agree to share their findings without waiting for publication or patents.

For years, foundations have been pumping money into research at various locations, often finding themselves frustrated with the pace of development. The new collaborative method is revolutionizing the medical field as it cuts years off development time. The five labs working for Johnson's foundation believe they have already saved 10 to 15 years on their goal of identifying a drug target and finding a promising compound by 2009.

There are concerns with this new method. Some scientists like the notoriety that accompanies innovation. Others might be driven out of the collaborative teams by intellectual property rights desires. Forcing scientists to share information takes away patenting from one laboratory, which often needs the money from sales of that patent to continue its work. The future of this method is yet to be determined, but for now, there are opportunities for business to play a role.

International disease control will present vast opportunities and challenges to businesses operating in afflicted countries or working to provide containment products and services. The ability of these corporations, along with governments and non-government organizations, to react and respond to outbreaks and to devise solutions that meet the health care needs of the world's population, will be critical to continued global prosperity. ❖

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