The China Syndrome: 
The Impact of the SARS Epidemic In Southeast Asia

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Abstract

The war in Iraq, the threat of terrorism and the Severe Acute Respiratory Syndrome (SARS) epidemic have made international business activities increasingly difficult and risky. The worldwide economic downturn and slow growth in domestic markets are forcing companies to depend more than ever on overseas trade. SARS emerged in China in November 2002 and has spread to 26 countries.

The SARS epidemic has caused the most severe economic crisis in Southeast Asia since the wave of bank failures and currency devaluations that swept the region five years ago. The SARS epidemic has prompted health officials to implement travel advisories and restrictions, in order to defer nonessential travel to regions of Asia with large numbers of SARS cases. They are enforcing quarantine and isolation measures in major cities to try and limit the spread of SARS. The President of the United States has signed an executive order adding SARS to the list of communicable diseases that can be quarantined. A major disruption in China could paralyze just-in-time supply chains and cause an economic crisis for retailers and other businesses worldwide. The SARS epidemic has caused many economists to drastically reduce their economic-growth forecasts for Asia.

New infectious diseases, such as SARS, can emerge and easily travel around the globe, infecting less-resilient hosts and mutating because of the influence of viruses and bacteria in their new environment. Health officials are even more concerned about the pandemic disaster that hasn’t happened, but may still. However, the SARS epidemic has created positive economic benefits for some companies.

Introduction

The economic downturn and slow growth in domestic markets are forcing companies in the United States and Europe to depend more than ever on overseas customers. The war in Iraq, the threat of terrorism and the recent S-
The SARS epidemic has been a source of suffering, death, and fear for many Asian families. Health-care workers have found themselves to be at a particularly high-risk for SARS. As of December 2003, the U.S. Centers for Disease Control and Prevention reported the following cumulative statistics on the SARS epidemic. The agency’s estimates on the total number of cases in each nation, along with the percentage of those cases that were constituted by health care workers, are presented in Table 1 below.

| Country     | Total Number of SARS Cases | Health Care Workers as % of Total SARS Cases |
|-------------|----------------------------|---------------------------------------------|
| China       | 5,327                      | 19%                                         |
| Hong Kong   | 1,755                      | 22%                                         |
| Taiwan      | 665                        | 13%                                         |
| Canada      | 250                        | 43%                                         |
| Singapore   | 238                        | 41%                                         |
| Vietnam     | 63                         | 57%                                         |
| United States | 164                      | 47%                                         |

Source: Centers for Disease Control and Prevention Statistics, reported in Regalado, Pottinger, and McKay (2003).

In its own perverse way, the SARS virus owes its rapid spread to globalization, and epidemiologists warn that it could be a preview of even more devastating epidemics to come. Just as SARS spreads from person-to-person and region-to-region, the disease is feeding an economic downturn. The initial sectors impacted are travel, tourism, and retail sectors, particularly in China, Hong Kong and Singapore. As more business people put off cross-border trips and tried to leave Asia’s cities, the economic losses escalated. SARS was a major disruption delivered another devastating blow to a global economy already suffering from war, fragile stock markets and stagnant demand in the U.S. and Europe. (Engardio, et al., 2003).

SARS emerged in China in November 2002 and has since spread to 26 countries. The ultimate risk of SARS is not known. However, businesses quickly implemented procedures to limit their employees’ risk, and public health officials worked to contain and combat the illness.
China and Hong Kong were the epicenters of SARS, and as such, they experienced far more economic and social impact from the initial outbreak of the disease. If a second worldwide wave of SARS outbreak emerges, it would have a huge impact on the developed countries’ economies and severely strain the world’s public health system, already struggling to cope with threats of biological and chemical terror (Lemonick and Park, 2003; Maiello, 2003). The SARS outbreak already appears to be too entrenched in two rural provinces of Shanxi and Inner Mongolia, both near Beijing, to be easily eradicated (Wonacott, et al., 2003).

The final economic cost could be enormous. The public-health outreach efforts, including quarantines, patient screening, and health education, have been quite costly to national governments throughout Asia. SARS also caused ripple effects throughout Asian industries, including retailing, airlines, electronics, and tourism. If the disease continues to spread in future years, quarantines could close factories and slow trade affecting the manufacturing sector, which accounts for about 30% of Asia’s gross domestic product (GDP) (Saywell, et al., 2003).

The SARS virus has created severe economic problems in China. The tourism industry lost large amounts of revenue from canceled hotel and flight bookings. Consumer demand was already fragile because of the war in Iraq, and it was further weakened as foreign business people either elected or were banned from travel to China. For instance, Korea’s largest chaebol, Samsung, joined other Korean companies in calling home employees’ families (Wehrfritz and Seno, 2003). Also, Japan and South Korea saw their exports decrease because of derivative manufacturing declines in SARS-infected countries. Both of these countries sell China’s capital goods, which translated into fewer orders (Wonacott, et al., 2003).

SARS has devastated Asian markets and the tourist trade of an entire region, nearly bankrupted airlines and spread panic through the populations of some of the world’s largest countries. Hospitals and schools have been shut down in major Chinese cities to prevent the disease’s spread. Thousands of people have been put under quarantine, and rumors spread rapidly through Beijing that martial law would be imposed (Lemonick and Park, 2003).

As the truth about SARS comes out slowly, due in large part to Chinese government cover-ups, it is becoming evident that the SARS epidemic in Asia threatens the entire world. Epidemiologists are concerned about a highly contagious, fatal disease that could spread quickly around the globe, and SARS might end up confirming their worst fears. We have seen that microbes can go wherever passengers on jet airliners fly. Thus, it is a very real possibility that SARS or another similar disease could have an even greater impact in the future (Lemonick and Park, 2003).

This paper looks at the SARS epidemic in retrospect. It examines the origins and nature of SARS and its spread in 2002-2003. It looks at the eco-
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The economic and logistical impact of the disease, both in Southeast Asia and globally. It also examines the role that the Chinese government played in downplaying the public health crisis and delaying a proper epidemiological response to the condition.

China’s Slow Response

China was ground zero for SARS and the fears of so many people. It was not until February 2003, three months after the first SARS cases were identified, that China admitted that there was even an outbreak. Then, for a month after that, the Chinese government assured world authorities that the epidemic was under control. Then, for more than a week, seven World Health Organization experts waited in Beijing when the government refused to let them visit Guangdong province, where SARS first surfaced.

Finally, after a global outcry, China began slowly releasing information the first of April and gave the WHO team approval to travel. Beijing also sharply boosted its figures on SARS, saying that 1,190 people had contracted the disease and that 46 had died. Still, China’s secretive attitude early in the SARS crisis may have contributed to the global outbreak (Engardio and Einhorn, 2003).

In Beijing, where the streets and freeways are usually packed with buses and numerous bicycles, there were suddenly no traffic jams. Restaurants and shopping malls resembled abandoned movie sets, with their windows shuttered and their doors chained shut. The scenes of calm masked a quiet frenzy, as contrary to previous government denials, Beijing’s residents learned that the city in fact had numerous SARS patients. Responding to this information, millions of residents went into self-imposed seclusion by staying in their homes in an attempt to protect themselves against the disease. Many residents who ventured outside wore protective masks and went straight to the supermarket to stock up on necessities, such as salt, oil and instant noodles, as if they are preparing for a siege. Police officers staffed checkpoints around the city and sprayed down buses with disinfectant solution. Elementary and middle schools closed, and some universities have refused to allow students to leave campus. The busiest places in Beijing were the railway stations, where frantic citizens try to buy a ticket out of town.

What began as a mysterious unknown illness has become a national crisis of confidence that threatened to cripple the Chinese economy and shook the ruling Communist Party to its foundations. The central government attempted to temper mounting outrage over reports that health authorities had systematically under reported the number of SARS cases in China and willfully deceived representatives of the World Health Organization (WHO) on their visits to Beijing hospitals. It is hard to gather information in such a large country under the best of circumstances, but the actions of Chinese officials have made the situation worse. In April, the Chinese government finally, grudgingly admitted that SARS is a problem and belatedly
allowed in a WHO team to investigate. In an aggressive attempt to contain the epidemic, Beijing officials ordered the quarantine of all offices, hotels, restaurants and residential buildings that may have been visited by infected individuals (Ratnesar and Beech, 2003).

On April 20, 2002, the Chinese National Health Minister was fired. This was the most public display of a government official being fired since the Communists seized power in 1949. The Mayor of Beijing was also fired on the same day. News of a widespread Shanghai coverup would further devastate the credibility of the national government and perhaps threaten the political future of China’s new President, Hu Jintao. After the disease surfaced in China’s southern Guangdong province in November 2002, party leaders quashed media reports about its existence, fearing the public would stay home during the Chinese New Year holiday, rather than spend money that could stimulate the economy. By early March 2003, when the National People’s Congress convened to inaugurate a new slate of senior leaders, doctors and members of China’s state-controlled media knew about the growing crisis, but they were prevented from reporting it. Chinese officials have revised their SARS patient numbers, but they never completely informed the WHO team about the pattern of spread (Ratnesar and Beech, 2003).

The coverup does remind the world that Chinese officials are capable of stonewalling when it suits them, and that the government might prefer to cover up problems than to be embarrassed by them. Letting the SARS crisis evolve unchecked also risks undermining the political image that the Hu administration has tried to create as a sympathetic champion of farmers, workers and the disadvantaged. President Hu and Premier Wen Jiabao have made well-publicized tours of hospitals treating SARS patients, even as the World Health Organization has accused Beijing of dragging its feet on the epidemic (Wonacott, et al., April 21, 2003; Wonacott, et al., May 6, 2003).

In the future, such stonewalling could be an even bigger problem for the international community. The warm, humid climate of southern China, with millions of people living in close proximity to pigs, chickens, and goats, combines to result in the world’s leading incubator for new viruses. The flu outbreaks of 1919, 1958, and 1969 that killed millions of individuals worldwide emerged from the region. Also, the explosion of air travel in an increasingly borderless world means that disease can navigate the globe with rapid speed (Engardio and Einhorn, 2003).

The slow response of Shanxi officials and health authorities in combating SARS underscores the challenges Chinese authorities face as the virus spreads into the country’s vast countryside. So far, China’s SARS cases have been concentrated in wealthier regions, such as the southern province of Guangdong and Beijing. Such areas have relatively modern medical facilities, well trained health-care workers and sufficient resources to deal with the crisis (Chen and Hutzler, 2003).
China’s lack of transparency is not the only weakness exposed by the SARS crisis. Although scientists around the world quickly collaborated to identify the virus, the public policy response was less effective. Hong Kong authorities waited more than a month to quarantine people exposed to SARS, thereby losing an opportunity to keep SARS from spreading around the globe. The Chinese government has been criticized for acting too slowly in warning people not to travel to infected countries. As the disease spread, it has become clear that the pharmaceutical industry must dramatically increase research efforts to find more effective treatment methods (Engardio and Einhorn, 2003).

The state-run Xinhua news agency reported in May 2003 about the firing of a group of 10 officials from Zhuozhou in the Hebei province. This includes the directors of the city’s health bureau and its disease-control center for failing to prevent a feverish woman who had returned from Beijing from infecting her family and others in the community. The dismissals were part of central-government efforts to enforce more political accountability and to lessen the population’s anger about a health crisis that was initially covered up in Beijing and other parts of China (Wonacott, et al., 2003). Some China experts predicted that former President Jiang Zemin, who continues to exert influence over the party, will try to shove Hu aside if the government failed to contain the SARS epidemic, and there is a downturn in China’s economy (Ratnesar and Beech, 2003).

What Is SARS?

According to the World Health Organization, the cause of SARS is a new virus. The virus is a type of corona virus, a viral family whose other members cause the common cold in humans. Scientists have recommended that the new virus should be named to commemorate Carlo Urbani, the WHO physician who identified the syndrome, became ill and died from it himself (Elliott, 2003).

The virus may have mutated into several subtly different strains, producing different symptoms. This might explain some of the perplexing transmission patterns seen on planes with passengers sitting next to a SARS victim and who did not always get infected, while those across the aisle sometimes did. Perhaps the latter had used a lavatory immediately after an infected passenger. Multiple strains of the disease would not be surprising, as this virus’ genetic code is based on RNA. This is a single-stranded molecule, which is very similar to DNA. However, RNA has no built-in proof-reading mechanism to fix mistakes in the replication process like DNA does. On a random basis, errors may prove to make the virus even more infectious (Lemonick and Park, 2003).

According to the CDC, the SARS virus causes a fever of greater than 100.4 degrees Fahrenheit, often accompanied by chills, headache, and body aches. After two to seven days, patients begin to cough. The SARS di-
agnosis includes one or more clinical findings of respiratory illness, including cough, shortness of breath, difficulty in breathing, hypoxia (deficiency in the amount of oxygen reaching the tissues of the body) and X-rays indicating the presence of pneumonia. The capillaries in the lungs begin to leak fluid into the lungs themselves. In severe cases, the lungs fill up with so much fluid that patients cannot get enough oxygen into their blood streams. Respirators can help, but this treatment is not always enough. Essentially, victims die from asphyxiation and lung damage, not from a massive inflammatory response to the pathogen, a phenomenon called sepsis. The CDC is not certain how long a patient with SARS may be contagious to others with whom they have had close contact (Tsang, 2003; McDonald, 2003).

There is still no cure for SARS. Patients are given supportive care for their symptoms, such as ventilators to aid breathing and fluids to prevent dehydration. Some scientists are searching for drugs that would block the corona virus infections and other scientists are trying to develop a vaccine. Scientists have already sequenced the entire genome of the corona virus, a major step in developing better treatments. Doctors and nurses caring for SARS patients should take proper safety precautions and wear masks, gloves and gowns and wash their hands regularly (Lemonick and Park, 2003).

**Transmission**

SARS cases have continued to appear farther from its source. Travelers brought the disease to Canada, where more than 160 people have likely been infected, and some have died (Engardio, et al., 2003). Most of those infected with SARS rapidly become ill and so can be easily identified. Compared with HIV/AIDS, there seems to be much less danger of them carrying the virus for prolonged periods without any outward sign of infection, thereby facilitating its transmission to others.

The global medical and scientific response to SARS, led by the World Health Organization, has been prompt and forceful. Individual SARS cases, along with persons they have been in contact with, have been tracked world-wide and when necessary, isolated. Scientists have also already identified the corona virus that causes SARS and has deciphered its genetic code. This makes it possible to test patients for the virus, and even allows doctors to measure the quantity of virus and determine which patients are the most contagious (Burke, 2003).

The World Health Organization has called for an urgent review of methods used to prevent the spread of SARS in China after visiting one large hospital not officially designated to handle SARS patients. The large number of healthcare workers becoming infected is raising new concerns, given the rudimentary level of medical services available to most of China’s 1.3 billion people. The number of SARS victims among medical staff has created tremendous strain on the Chinese health-care system. In Beijing, 18% of all
SARS patients are health-care workers. In nearby Tianjin, health-care workers account for 45% of SARS patients (Wonacott, et al., 2003).

SARS is spread primarily through the air when someone infected with the virus coughs or sneezes (Sedgwick, 2003). However, research indicates that the virus can survive on surfaces for more than a day (Wonacott, et al., 2003). SARS does not appear to spread as far or as fast as the flu virus, which can spread more easily through the air. At first, the infection was transmitted mainly in hospitals, at homes, and in one Hong Kong hotel. Researchers concluded that the virus that causes SARS is spread mainly through face-to-face contact in droplets when victims cough. Yet, there is evidence that the virus may survive on doorknobs or other surfaces for several hours, to be picked up when touched and transported to the mouth, nose, or eyes. The virus can also be transmitted through faeces. An outbreak in a Hong Kong apartment building raised fears that the virus could be transmitted through sewage or water systems (Anonymous, *Morbidity and Mortality Weekly Report*, 2003).

The potential for transmission of SARS during airline travel is unknown. Transmission of other infectious agents, such as Mycobacterium tuberculosis, during air travel has been demonstrated. When an airline flight crew reports a passenger with respiratory illness, quarantine officials might board the aircraft on arrival in the United States to assess whether the passenger’s symptoms match the case definition of SARS and to give the passenger information about following up. If a passenger with suspected SARS is identified after passengers have disembarked, public health authorities will work with the airline to contact passengers and crew for information about the development of an illness suggestive of SARS. Sick travelers appear to have spread SARS across international borders. However, the proportion, if any, of persons who actually acquired SARS as a result of in-flight transmission is unknown (Anonymous, *Morbidity and Mortality Weekly Report*, 2003).

SARS is a new pathogen, and there are many unanswered questions. SARS’ modes of transmission is alarming specifically because it spreads from person-to-person. For instance, people get West Nile disease mainly from mosquitoes who have the virus, not from their neighbors. In the Nipah outbreak, victims only get the disease from pigs. AIDS and hepatitis C can be avoided by shunning dirty needles or high-risk sex. In contrast, it’s possible to get SARS in the process of daily life, such as being on a certain plane or lodging in a certain hotel (Anonymous, *Morbidity and Mortality Weekly Report*, 2003).

Scientists have found that the SARS virus can survive on surfaces at room temperature for longer than a day, and in human waste, suggesting there are multiple ways in which the disease might be transmitted. Researchers believe most people get infected by droplets spread by face-to-face con-
The Hong Kong government’s virus unit found that the SARS virus lives in conditions of low acidity. Tests showed that while the virus disappeared after about six hours in regular stool, it survived for up to four days in diarrheal stool. Since at least 10% of SARS patients have diarrhea, it lends credibility to a theory that some people get infected through an oral-faecal route. This method of transmission has been suspected of spreading the disease in the Amoy Gardens apartments in Hong Kong, which was that city’s most virulent outbreak. Investigators there found infected fecal matter in toilets and kitchen sinks. The disease may have thus spread when people rubbed their eyes or nose without washing their hands (Naik, 2003).

A series of tests conducted at the National Institute for Infectious Diseases in Tokyo found that the SARS virus, when stored at four degrees Celsius (which is the temperature of a typical refrigerator), survived for at least four days. Alarmingly, at significantly lower temperatures, the survivability was the same. A lab at the University of Marburg in Germany found that the virus can survive at typical refrigerator temperatures for 21 days! Thus, the SARS virus is more resistant than other human corona viruses (Naik, 2003).

The latest findings about the virus’ ability to survive in different environments is vital to medical personnel who need to decontaminate everything from hospital linen to bed pans. Lab tests suggest that normal concentrations of common disinfectants, used on surfaces and skin, would kill the virus after five minutes (Naik, 2003).

**Suspected Source of SARS**

The sources of the SARS virus are unknown. It may have entered the human population like many other novel diseases as a result of new opportunities for contact with infections that are carried by other species. For example, the hantaviruses that cause hantavirus pulmonary syndrome in the Americas are all natural infections of common wild rodents. Hantavirus pulmonary syndrome, which is characterized by acute respiratory distress and is fatal in 40-60% of cases, was first recognized in an outbreak in the southwestern U.S. in 1993. Scattered cases had occurred for years throughout North America, but they went unrecognized until the larger outbreak focused attention on the disease. It was later learned that changing environmental conditions had led to a rodent population explosion, thereby increasing human contact with the animals and the viruses they carried (Morse, 2003).

SARS is believed to have originated in the Chinese province of Guangdong in November 2002. Guangdong is a notorious crucible of disease, thanks to the crowded living conditions and the native’s habit of living close to animals. Some scientists believe this behavior leads to new illnesses being formed by genetic mutation crossing the species barrier and entering the human population. However, the Chinese authorities failed to alert any
outsiders to the existence of the virus, allowing it to spread unchecked (Anonymous, “Not only bad for your health,” 2003).

Chinese farmhands feed their animals with garbage purchased from restaurants. Chickens also have free run of the farm and crowd the troughs for their share of the food. Unfinished food from last night’s meal, including clam shells and other seafood leftovers, still litter the ground. Many livestock farms in southern China’s Guangdong province are not licensed by the local authorities. However, unregulated farms are not the only places where people and animals live close together in China. In many restaurants, there is the zoo-like stench. Animal cages are stacked in the doorway and hold whatever happens to be on the evening’s menu, snake, chicken, duck, rabbit, even a black kitten (Schafer and Guterl, 2003). South China has long practiced this unique traditional form of agriculture, which places pigs and ducks in close contact. This close contact may facilitate the development of new influenza strains by placing ducks, which are the reservoir of influenza diversity, and pigs, which are the possible mixing vessels for mammalian influenza strains, in close proximity with each other and with humans (Morse, 2003).

Corona viruses have long been known to veterinary medicine because they routinely infect livestock, ducks and other domestic animals. In humans, they had never caused anything worse than a cold. However, the SARS strain is clearly different. Given belated access to Chinese records, the WHO teams are looking carefully at the records of human cases. They also plan to conduct more detailed studies of unusual infections in animal populations. If they can find animal hosts, the WHO might be able to prevent new animal to human transmissions (Lemonick and Park, 2003).

SARS is a coronavirus, like the common cold. However, its origin in southern China implies a zoonotic pathway, similar to influenza’s. If SARS started as a water-borne bird virus, it might have been passed via faecal droppings to a chicken or a pig, or even directly to people. Along the way, the original virus probably mutated spontaneously and exchanged genes with viruses from other animals, acquiring new characteristics (Schafer and Guterl, 2003).

The modern world is a prime environment for infectious agents to present a serious threat to human health and international security. New infectious diseases, such as SARS, can emerge and easily travel around the globe, infecting less-resilient hosts and mutating because of the influence of viruses and bacteria in their new environment (Elliott, 2003). Once the sources of the SARS virus are known, it may well be possible to develop protective measures. If SARS is maintained in nature, it can be reintroduced periodically from its natural sources. By understanding the ecology of diseases like SARS, future outbreaks may be prevented (Morse, 2003).
Health officials are even more concerned about the disaster that has not happened, but may still. SARS is serious. However, it is not the worst disease that could come from the petri dish of southern China. The influenza pandemic of 1918, which killed 20 million people, makes the current SARS epidemic minor by comparison. If reporting and environmental conditions do not change, China will only continue to export new pathogens. And as the genetic dice continue to roll, the likelihood of a truly devastating new disease continues to increase. The first step to preventing the next outbreak, of course, is figuring out what caused this one. The leading theory is that SARS originated, like most influenza viruses, in aquatic birds (ducks, perhaps) and then made the jump to humans (Schafer and Guterl, 2003).

SARS Test

The virus, isolated from the lung tissue of a patient who died from SARS, is the basis for the diagnostic test. This spectacular achievement is an example of what the world can do when the intellectual resources of nations around the world are focused on a single problem. This rapid advance is fueling the hope that SARS can and will be contained. The progress comes from the WHO having pulled together the talent from eleven laboratories around the world in an unprecedented collaboration to identify the disease (Anonymous, “Acute Respiratory Syndrome,” 2003).

SARS Vaccine

NIH researchers have received samples of the virus from the CDC. They are presently conducting research toward identifying what makes the cells grow and replicate, so that, eventually, a vaccine can be manufactured in large quantities. Researchers also must conduct animal studies. That means finding a way to effectively infect the animal, and then testing whether the vaccine works to prevent infection. In the end, they hope to produce a killed vaccine that uses a dead version of the virus (Anonymous, “Severe Acute Respiratory Syndrome,” 2003).

GenVec, an American biotech company, recently announced plans to collaborate with NIAID to insert portions of the corona virus genome into a weakened cold virus. If the proteins generated by these snippets are powerful enough to trigger an effective immune response, then the resulting vaccine might be successful. NIAID is also coordinating separate U.S. government efforts to develop vaccine candidates (Lemonick and Park, 2003).

SARS Virus Detection

A German biotechnology company has produced the first commercial test for the SARS virus. The company, Artus, is distributing the test free of charge to specialist laboratories around the world. The test can confirm the presence of the corona virus that is widely believed to cause SARS. The test
can detect the virus in throat swabs, saliva, and faeces, and produces a result in just 2 hours, whereas current antibody tests take at least 10 days (Benitez, 2003).

Singapore uses an infrared fever-sensing modified thermal camera to detect individuals with fever. It is a modified camera, used originally for security operations. Since mid-April, all departing passengers and some arriving ones have been checked at Singapore’s Changi Airport. If monitors see red, the person is pulled aside for a more conventional temperature check (Borsuk, 2003).

Treatment

The World Health Organization (WHO) has indicated that advances by the University of Hong Kong and others are bringing scientists closer to determining how to treat SARS (Anonymous, “Acute Respiratory Syndrome,” 2003). However, there is still no good treatment for SARS. Now knowing the viral genetic sequence, researchers can start to develop more rapid tests for the disease. This research will proceed rapidly, precisely because scientists can work with the genes, rather than the whole virus. These genes are not infectious. Thus, scientists can take fewer precautions and perform faster research. The monkey model also allows scientists to test for ways that SARS spreads. If doctors can determine how SARS is transmitted, then they can determine better methods to block it (Elliott, 2003).

Other Epidemics

Three “superepidemics,” known as pandemics, of influenza encircled the globe during the 20th century. History teaches us that the devastating 1918 influenza epidemic began with a modest level in the spring that faded away during the summer, only to explode and wreak global devastation the following fall and winter. The first was the 1918 Spanish Flu, a scourge that killed over 20 million people world-wide, including 500,000 in the U.S. The 1957 Asian Flu and the 1968 Hong Kong Flu killed 69,800 and 33,800 respectively in the U.S. Flu pandemics happen when the flu virus mutates, swaps genes with another organism inside an infected animal, or jumps from animals to humans. It is possible that SARS could follow a similar pattern and fade away, only to erupt again in a following year (Burke, 2003; Chase, 2003).

As the SARS epidemic abates, experts also point out that there have been more scares in recent years than actual pandemics. The 1976 Swine Flu Scare, 1977 Russian Flu Scare and 1997 Avian Flu Scare were all feared to be the next pandemic. These fears proved erroneous. However, in the Avian Flu scare in Asia, 18 people were hospitalized, six died and 1.5 million chickens were slaughtered in Hong Kong (Chase, 2003).
Insurance Coverage

In the latest economic fallout from the spread of the SARS disease, insurance companies now are excluding coverage for SARS from policies written to insure conventions, sporting events and trade shows world-wide. The SARS exclusion mostly applies to so-called event-cancellation coverage. Such coverage puts an insurer on the hook to pay if an event is canceled or postponed, or if there is reduced attendance for reasons beyond the control of the policyholder (Oster, 2003). International travel insurance policies do not cover change of mind because of SARS or any other illness. Also, it does not matter if the State Department issues a travel advisory for a disease, unless it is confirmed that the disease is caused by terrorists (Calian, 2003).

The insurers have added the SARS exclusions precisely because the risk is so real that they can make the argument it is a clear and present risk that they are not willing to accept. Insurers equate offering SARS coverage with writing a policy for a building that is already on fire. In fact, insurers put similar exclusions on policies when Europe experienced a foot-and-mouth disease outbreak and when Britain saw mad cow disease erupt (Oster, 2003).

In policies issued before the SARS exclusions were added, disputes are likely to arise because underwriters will question whether fear of contracting SARS as opposed to actually having the virus, which is covered by a policy. Brokers said there already have been SARS claims filed with insurers in London related to events in Hong Kong, but none so far in the U.S. (Oster, 2003). It does not matter if the CDC, the WHO or even the U.S. State Department issues a travel warning for a disease, policies still will not cover a trip cancellation if the customer is healthy. However, if there is a major disease such as SARS on a cruise ship and the ship has to be quarantined, your travel insurance would cover any trip interruption and pay for accommodations or travel home (Calian, 2003).

Insurance for conventions and other crowd-drawing events is typically purchased months or even more than a year in advance, so most events in 2003 had coverage. However, SARS coverage will become a bigger issue for event planners in 2004 and beyond. The biggest sellers of event coverage are syndicates of Lloyd’s of London, which has universally applied the exclusions. Other main writers of the coverage have had a moratorium on issuing new event policies since the start of the Iraq war. When the companies began writing the policies again, the policies contained a specific SARS exclusion (Oster, 2003).

Quarantine

On April 4, 2003, the President of the United States signed an Executive Order adding SARS to the list of communicable diseases which can be quarantined. This act provides CDC, through its Division of Global Migration and Quarantine, with the legal authority to implement isolation and quarantine
measures, as part of transmissible disease-control measures. Isolation refers to the practice of keeping a patient with a communicable disease separate from other persons, usually in a health-care facility or at home. Isolation is used routinely in hospital and health-care settings to reduce the transmission of infections to patients who are not infected. Quarantine refers to any situation in which a person or group of persons who have been exposed to a communicable disease and might be infected, but who are not yet ill, are kept apart from others to prevent disease spread.

States generally have authority to invoke and enforce quarantine in their jurisdictions, although quarantine laws vary among states. Quarantine has proven to be an effective public health tool. Quarantine in the United States is used primarily to restrict patients with pulmonary tuberculosis, who remain infectious but are unable or unwilling to remain in a place where they are less likely to transmit illness.

During March 2003, health officials in Singapore, Hong Kong, and Canada have implemented quarantine and isolation measures to try and limit the spread of SARS. These countries are discovering how hard it is to implement a quarantine program in an era of fast information, global travel and concern over civil liberties (Anonymous, MMWR, 2003; Pottinger, et al., 2003).

Despite the city of Beijing’s decision to quarantine nearly 9,000 people and wash the city streets with disinfectant, the capital still needed two to three months to achieve control of the SARS epidemic after the spread of the disease peaked. In Beijing, schools, movie theaters and restaurants were closed. Rumors of a citywide quarantine were rampant. However, college students, migrant workers and other residents of the capital routinely ignored makeshift roadblocks and requests from the government that they stay at one location, instead heading for what they perceived to be the relative safety of the countryside (Hutzler and Wonacott, 2003). In Hong Kong, officials had taxicabs and elevators scrubbed down, handed out face masks to the population, and have quarantined an entire apartment block. Singapore canceled conventions and kept 1,500 potential disease-carriers under virtual house arrest. In San Jose, California., authorities held 139 people on board a jet from Tokyo for two hours after five people showed symptoms of SARS, even though they turned out not to have the disease (Engardio and Einhorn, 2003).

About 5,000 people were quarantined in Taiwan. The WHO listed Taiwan among the areas with recent local transmission, a category which also includes Toronto, Singapore and several cities in China (Wonacott, et al., 2003). When cases started appearing in Singapore, the government for the first time invoked its Infectious Diseases Act and ordered more than 1,500 people to quarantine themselves at home for 10 days. Both Singapore and Hong Kong closed all public schools to try and stop the SARS spread.
All across the region, authorities vigorously sprayed disinfectant, scrubbed down sidewalks and floors in hotels, offices, and markets, and wiped down elevator buttons and door knobs to try to stop the spread of SARS (Engardio, et al., 2003).

**Businesses Environment**

SARS has caused the worst economic crisis in Southeast Asia since the wave of bank failures and currency devaluations that swept the region five years ago. The economies of Hong Kong, Malaysia, Singapore, Taiwan and Thailand have not just abruptly stopped growing, but they either experienced a SARS-induced decline or stagnation. Even China’s booming industrial expansion slowed under the weight of SARS (Bradsher, 2003). Analysts across the region are forecasting losses approaching the magnitude of the 1997-98 Asian financial crisis. BNP Paribas downgraded its 2003 gross domestic product (GDP) forecast for eight Asian countries by 0.4 to 1.5 percent. Goldman Sachs also warned that losses in Hong Kong could reach 31%, in Singapore 26%, in Taiwan 20% and in Thailand 15% of their GDP in the second quarter of 2003, or around $38 billion just in those four economies. Thus, Beijing’s mismanagement of the outbreak could undermine investors’ trust in the world’s fastest-growing economy (Wehrfritz and Seno, 2003).

SARS could be the biggest challenge the Chinese manufacturing sector has faced since the 1989 Tiananmen Square massacre. For the past decade, the Pearl River Delta has been growing as a seemingly unstoppable power, producing $110 billion in exports annually with $17 billion in foreign direct investment. The region’s low wages, good infrastructure, and efficient logistics can not be matched elsewhere. As a result, the Delta has become one of the world’s most important production bases for everything from stuffed toys to personal computers, due to an explosion of investments from Taiwan, The United States and Japan (Einhom, Et Al., 2003).

**Airlines**

Airlines became the frontlines in germ warfare against SARS, a deadly atypical pneumonia that is spreading rapidly worldwide. The U.S. State Department advised citizens to defer nonessential travel to regions of Asia, where a large number of SARS cases have appeared. The Centers for Disease Control and Prevention has issued SARS guidelines for all personnel associated with air travel (Fiorino, 2003).

A Business Travel Coalition survey of 180 companies, who average 31 round trips a month to Asia, found that 27% of the companies were restricting travel to the continent because of SARS. Some international airlines, including British Airways, Europe’s biggest airline, and Delta Air Lines reported sharp drops in air travel on their Asian routes. Delta, the world’s third largest carrier, indicated that air traffic in the Pacific region was down 21%. KLM Royal Dutch Airlines blames a dramatic drop in bookings.
in Asia on fears of the SARS virus. Singapore Airlines said it will cut 60 weekly flights, in addition to 65 prior cuts it had imposed because of decreased demand (Buckman and Weinstein, 2003; Carey, et al., 2003).

Traffic at Inchon International Airport in Seoul dived 39.65%, from an average of 58,000 a day last year to 35,000 for the first two weeks of April 2003. The decrease in demand was attributed to the drastic reduction of flights from Southeast Asia, China and Japan, its main markets. Thailand’s four international airports, in Bangkok, Phuket, Chiang Mai and Hat Yai, all are experiencing a drastic drop in traffic. Airports of Thailand indicated that the worsening situation in Hong Kong and China, along with the spread of the disease to other parts of the world, is preventing people from traveling to the region. Kuala Lumpur International Airport (KLIA) recorded a drop of 27% in traffic in the first two weeks of April 2003. The Malaysian government stopped issuing visas to tourists from China, Vietnam, Hong Kong and Canada, due to the widespread of the disease in these countries (Dennis, 2003).

SARS hastened the demise of Air Canada, which entered bankruptcy protection on April 2, 2003 with $8 billion (U.S.) in debt, a daily cash outflow of $1.3 million (U.S.) and just $255 million (U.S.) in the bank. Its cross-Pacific routes, which were the carrier’s most profitable, suffered 50% cancellation rates after SARS broke out (Maiello, 2003). Cathay Pacific Airlines swiftly denied they were considering grounding its entire passenger fleet in response to the devastating effect of SARS on travel to and from its Hong Kong bases. Cathay Pacific’s daily passenger numbers fell from 30,000 to 10,000 in April 2003. Cathay’s Airlines may be the most striking example of the economic damage caused by the deadly new SARS disease (Anonymous, “Not only bad for your health,” 2003).

The Electronics Sector

SARS has also jeopardized the $1 trillion-dollar global electronics industry. Over the past five years, China has emerged as one of the world’s leading manufacturing centers for everything from computers to cell phones to cameras, as well as myriad parts and materials. A major disruption could paralyze just-in-time supply chains of electronics makers and retailers worldwide. If factories and ports have to close and if chips can not be moved on airplanes to meet inventory needs, then inventory problems will quickly result. SARS has led many leading United States’ companies to reconsider their heavy reliance on China as a production base (Engardio, et al., 2003).

Investments

Beijing’s faulty crisis management’s lack of sharing of information about SARS is creating doubt among foreign investors that do business in China. Although the first SARS cases surfaced in the southern province of Guangdong in November 2002, China only started providing updates on the
number of new cases to the World Health Organization in the first week of April 2003, after the disease had spread to 18 other countries and territories (Wonacott, et al., 2003).

Last year, foreign investors invested $52 billion in direct investment in China. The frenzied pace of deal-making that has marked the past few years has however been slowed, in large part by SARS. Southern Guangdong’s Canton trade fair was cut short in April 2003, with only $3.31 billion of contracts signed. This represents less than one-fifth of the total value of contracts stemming from the 2002 event. Several economists have decreased China’s projected 8% growth rate by two points (Hutzler and Wonacott, 2003). The public-health crisis has taken a toll on a new leadership trying to establish its credibility with foreign investors, as China’s reputation has been damaged at both the regional and national level (Wonacott, 2003).

The longer-term economic threat to China is that executives of multinational companies will began to view the country as a riskier place to invest. Heavy inflows of foreign direct investment are a major reason China was able to maintain growth after the financial crisis that swept through Asia five years ago. If Beijing is perceived as being unable to manage a disease, such as SARS, and concern rises over how the epidemic affects supply lines, then investors might come to regard China’s business environment as unreliable (Engardio, et al., 2003).

Travel

Travel restrictions are now in place at airports around the world after the World Health Organization (WHO) urged airports in SARS-affected cities to question passengers about their health before check-in and to discourage anyone who had a fever within the past 24 hours from flying. In addition to the airports serving Beijing, Shanghai, Guangzhou, Hong Kong, Singapore and Hanoi, restrictions have also been introduced in Toronto. This came after an elderly couple returning from Hong Kong brought the SARS disease to Canada, where there have been almost 300 reported cases. In addition to restrictions at airports and the WHO’s travel warning, many countries have urged their citizens to reconsider traveling to Asia. This would not just adversely impact the region’s tourist industry, but also other business activities (Anonymous, “Not only bad for your health,” 2003).

A Business Travel Coalition survey of 180 companies, averaging 31 monthly round trips to Asian countries, found that 27% had restricted travel to Asia because of SARS. Of those companies, all indicated Hong Kong was banned as a destination, and more than 80% said they had prohibited travel to mainland China and Singapore (Carey, et al., 2003). The week-long May Day holiday was also canceled in April to prevent travelers spreading the disease (Anonymous, April 22, 2003).
Malaysia has banned Chinese tourists because of fears about SARS. The United States has advised travelers that the quality of health services, in places such as Hong Kong and Hanoi, was being affected by the SARS-pressure on hospitals. The WHO stated that travelers should postpone all but essential travel to Toronto, Beijing and China’s Shanxi province, adding those cities to a list that includes Hong Kong and the Chinese province of Guangdong (Anonymous, “Not only bad for your health,” 2003; Chang, 24, 2003).

Cisco, Toshiba, and Taiwan Semiconductor Manufacturing have also restricted or banned travel to Guangdong and Hong Kong. Continental Airlines has suspended all flights to Hong Kong, while other airlines have cut back schedules sharply. Some experts warn that the virus could work to boost the appeal of countries that have lost factories to China (Einhom, 2003).

The lucrative convention business has also suffered around the Asia region, with major conferences canceled in popular destinations such as Singapore, Bangkok and Shanghai. The World Economic Forum’s China summit, which was to have been held in Beijing in early April, was also canceled. Hong Kong’s Trade Development Council decided to combine its April Housewares and Gifts & Premium fairs, which normally attract up to 80,000 visitors, into two optional sessions, one in April and the other in July. Some 3,500 exhibitors chose only the summer event, and 900 withdrew from the events altogether (Saywell, 2003).

The potential economic reach of SARS was demonstrated at the Canton Trade Fair, which opened in Guangzhou, near the original epicenter of the disease. Overshadowed by a WHO travel warning to avoid Hong Kong and the entire Guangdong province, the export fair, once the single most important event in China’s economy, is effectively dead. In 2002, the fair drew more than 120,000 visitors, a fifth of them from outside China, from the textiles, toy, furniture and electronics industries, with nearly $17 billion contracts being signed. In 2003, despite promises from authorities to disinfect public spaces and restaurants, travel agents were concerned about the large amount of cancellation requests accumulating on their desks (Anonymous, “A plague on all our businesses: SARS,” 2003).

Video Conferencing

Teleconferencing has been on a long upward growth path, including a 38% jump in calls in the second half of 2002 over the year-earlier period. Some industry executives are optimistic that SARS will turn teleconferencing into a habit that will continue for more business people, even when travel to Asia resumed (Clark, 2003).

Logistic and supply problems are beginning to develop between U.S. and European companies and the Asian operations that supply many of
the world’s goods. Adidas-Solomon AG has prohibited their employees from traveling between Hong Kong and its factories across the border in Guangdong province, which produce 53% of the company’s footwear. The German company is using video conferencing to replace face-to-face contact. As new products are released, the travel freeze became more problematic, forcing Adidas to consider moving some of its production to other less-affected countries, such as Vietnam and Indonesia (Kahn, et al., 2003).

Video conferencing is becoming a creative option across Asia. J. C. Penney Company’s design team and product managers have been coming to work early, so that they can conduct video conferences with their Asian staff many time zones away. Design teams are also staying later for a similar reason. Their business is about relationships and meeting face-to-face with suppliers to help build relationships. An investment in upgrading video conferencing gear earlier this year has paid off for Phoenix Technologies Ltd., a San Jose, California, maker of personal-computer software. Phoenix Technologies used video conferencing once every two weeks last year; now they use it daily to communicate with Asian operations (Kahn, et al., 2003). Polycom Inc. is helping to install video conferencing equipment in hospitals in Asia, where SARS patients have been isolated for long periods of time, so that they can make contact with family and friends during their isolation (Clark, April 30, 2003).

Economic Impact

Until the SARS epidemic, Asia was the global economy’s only bright spot during the worldwide recession. Morgan Stanley predicted that SARS could trigger a global downturn by slowing expansion in Asia. It warned that SARS could decrease global economic output by 0.1%, pushing growth below the 2.5 percent level worldwide, which is the rate economists generally recognize as the threshold of recession. SARS ultimate economic effect depends mostly on how far it spreads and if it recurs. If the latter happens on a widespread basis, the economic effects would be catastrophic (Wehrfritz and Seno, 2003).

SARS is causing some economists to reduce their economic-growth forecasts for China. J.P. Morgan Chase decreased their China forecast for the second time, and now predicts economic output will decrease by 2% during the second quarter of 2003. Citigroup revised its growth forecast for China to 6.5% from 7.6% for the full year, adding in a note to clients information that its assumption that the SARS outbreak would be contained within five weeks is too optimistic. Citigroup expects a 5% decrease in China’s economy in the second quarter (Chang, April 24, 2003).

Morgan Stanley in Hong Kong estimates that SARS will this year take 0.6 percentage point off real GDP growth for Asia, excluding Japan,
Australia and India, at a cost of $15 billion. The World Health Organization estimates that the global cost of SARS to date is nearing $30 billion (Saywell, et al., April 21, 2003).

Wall Street Journal research based their research on government and financial institutions’ information. Their revised assessments of GDP forecast losses in economic output in 2003 due to SARS are as follows: China, $2.2 billion; South Korea, $2.0 billion; Hong Kong, $1.7 billion; Japan, $1.1 billion; Singapore, $930 million; Taiwan, $820 million; Malaysia, $660 million; Thailand, $490 million; Indonesia, $400 million; Philippines, $270 million; and Vietnam, $111 million (Saywell, et al., April 21, 2003).

Governments and brokerage houses around the region also have downgraded full-year economic growth estimates. In Singapore, Prime Minister Gob Chok Tong forecasts SARS could decrease its GDP by as much as a half to one percentage point off GDP growth this year, or up to $875 million. The Thai Ministry of Finance has trimmed its GDP forecast one percentage point or as much as $1.3 billion (Saywell, 2003).

Unintended Benefits

The SARS epidemic has created positive economic benefits for some companies. Wal-Mart, the world’s largest retailer, indicated its move to video conferencing could further help cut its costs because of less travel. Las Vegas also has been a beneficiary. Some high-rolling Asians view the city, which has had no SARS cases, as something of a haven. As such, instead of staying a couple of days in Las Vegas’ casino hotels, they stayed for weeks (Kahn, et al., 2003).

The SARS outbreak has meant new business for private-jet firms, catering to executives and others. MetTojet Ltd. in Hong Kong, Jet Asia Ltd. in Macau, and Beijing-based Deer Jet Company have seen a marked increase in business since the SARS outbreak. Bombardier Inc.’s Flexjet Asia Ltd., a Hong-Kong based booking service for private jets, received 100 calls a week for reservations, instead of the usual 10. Most of their calls inquired about long-range flights, away from the affected area. Most of the airline’s clients were executives from multinational concerns or elite society Hong Kongers, who have the cash to pay as much as $150,000 for a 20 seat plane flight to far-flung destinations, such as North America or Europe. Metrojet, which operates two jets out of Hong Kong’s International Airport, has seen inquiries double and new clients grow by 30%. Destinations also have changed. While travel inside China normally accounts for 60% of Metrojet’s business, currently, flights have been chartered to regional locations, such as Japan, South Korea, Singapore and Malaysia (Voight and Dean, April II, 2003).

SARS also spurred a growth opportunity for firms seeking to solve the problem of telecommunications services for stay-at-home workers.
PCCW Ltd., Hong Kong’s biggest fixed-line carrier, indicated Internet traffic has jumped 20% since the SARS outbreak began. Singapore Telecommunications Ltd. says new subscriptions for broadband Internet services doubled since the SARS outbreak (Voight and Dean, 2003).

Conclusion

The war in Iraq, the threat of terrorism and the recent Severe Acute Respiratory Syndrome (SARS) epidemic have made international business activities increasingly difficult and risky. The worldwide economic downturn and slow growth in domestic markets are forcing U.S. and European companies to depend more than ever on overseas customers.

SARS emerged in China in November 2002 and has spread to 26 countries. It was not until February 2003, three months after the first SARS cases were identified, that China admitted that there was an outbreak. Then, for a month after that, the Chinese government assured the world authorities’ that the epidemic was under control. Finally, after a global outcry, China began slowly releasing information in April and gave the WHO team approval to travel in the country.

The SARS epidemic has caused the most severe economic crisis in Southeast Asia since the wave of bank failures and currency devaluations that swept the region five years ago. The longer-term economic threat to China is that executives of multinational companies will began to view the country as a riskier place to invest. Heavy inflows of foreign direct investment are a major reason China was able to maintain growth after the financial crisis that swept through Asia five years ago. If Beijing is perceived as being unable to manage a disease, such as SARS, and concern over the epidemic affects supply lines, then investors might come to regard China’s business environment as unreliable.

The SARS epidemic has prompted health officials to implemented travel restrictions at airports around the world and enforced quarantine and isolation measures in major cities to try and limit the spread of SARS. The President of the United States has signed an Executive Order adding SARS to the list of communicable diseases that can be quarantined. A major disruption in China could paralyze just-in-time supply chains and cause an economic crisis for retailers and other businesses worldwide. The SARS epidemic has caused many economists to drastically reduce their economic-growth forecasts for Asia. However, as we have seen, the SARS epidemic has created positive economic benefits for some companies.

The “final” statistics on the SARS outbreak worldwide, as of late December 2003, are as follows:
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- Cases - 8,099
- Deaths - 774
- Case Fatality Ratio - 9.6% (Fuhrmans, McKay, and Leggett, 2003).

What does the future hold? In January 2004, the Chinese Health Ministry confirmed its first new case of SARS in over eight months with the diagnosis of a 32-year-old television producer in the southern province of Guangdong. Suspected cases have also surfaced in the Philippines (Anonymous, “China Confirms First SARS Case Since July,” 2004). Is this an anomaly, or will this be the harbinger of a new outbreak of this disease and its devastating human and economic toll? Only time will tell, but businesses should heed the advice of McKinsey and Company in being proactive in their approach to dealing with ongoing and emergent public health concerns (Gupta and Taliento, 2003).
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