

# **Economics & Epidemics: An Expansion of Managing Risk & Enhanced Accountability**

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*Epidemics caused by infectious agents are expected to intensify with the expansion and penetration of emerging markets. The impact of these epidemics on global business can no longer be considered an unpreventable risk or “black swan”. This paper examines recent epidemics and suggests the importance of corporate responsibility as well as risk management strategies to mitigate global business disruption.*

## **INTRODUCTION**

The benefits of global business have somewhat obscured concerns over the risk of such business endeavors. Even when the evaluation of political environments, regulation, currency, culture, demographics, and labor availability are not always favorable, businesses have continued to expand globally. Companies have experienced success, especially as the American economy becomes increasingly competitive and crowded. Manufacturing has seen globalization as a way to cut costs and retain profitability, despite a lagging domestic economy due to the emergence of middle classes and economic access that has increased the attraction of global markets. In addition, industrialized economies have become heavily dependent on natural resources found in these remote locations to drive production.

Considering these factors, it is assumed that the movement of business into global locations will only continue, with the concerns of managing risk centered on financial, geo-political, technical, social / demographic and transportation factors. The supply chain considerations such as supplier quality, security, compliance and corruption are also major considerations. The growing complexity of global supply chains and the potential disruption they present may result in economic loss or reputational damage. But yet, this complexity is one that is competitively required for multinational companies and considered as a requirement of doing business (Switzer, 2014).

More recently, the emergence of infectious disease has not been well understood or factored into the risk assessment of emerging economy investment and business development. Therefore, the existing complexity of risk management is now further exacerbated by the unpredictability of epidemics and their impact on global business.

## **EPIDEMICS & IMPACT**

There have been a number of significant epidemics which have drawn attention due to their adverse impact on global business. The frequency and rate of such epidemics and their impact on major population centers is expected to increase. The World Health Organization points to urbanization as a contributing factor to the increased virulence and transmission of infectious agents (WHO, 2014).

Although urbanization promises improvements and enhanced quality of life, it is the misalignment of infrastructure development generally centered on the transportation and movement of natural resources, products and people between formerly remote locations without the required investment in health care services, supplies, and training to support increased population density that causes the problem. Also, the pathogens causing many of the recent epidemics are resident in animals in rural areas that are transmitted to humans when natural barriers are removed by expansion. This zoonosis or spread from animals to other species complicates the control of pathogens due to the lack of readily available vaccines or therapeutic regimes.

Consequently, the emerging economies which are the targets of global business are also the nations that have experienced the most epidemics with the most far reaching and consequential economic impact. These countries have the lowest standards of living, economic disparity, and the greatest prevalence of infectious diseases. In addition most of these countries have not had the luxury of political stability, control over natural resources, education, and health care advancements. A precipitating factor is the urban to rural population concentration and urbanization for access to employment and services which once infected perpetuates the virulence of these infectious agents in highly populated centers. These urban centers are ill-equipped to deal with the epidemic due to inadequate health care services (WHO, 2014; IOM 2003).

The economic impact of epidemics includes not only the infection rate, but the indirect economic impact causing billions of dollars in economic loss yearly. The direct cost includes hospitalizations, insurance expense, outpatient visits and the largest outcome, death (Eshleman, 2014). The billion dollar estimate does not include the disruption to commerce or to the society and estimates of the total cost of epidemics are insufficient to date in identifying the economic impact and do not adequately factor in the business loss on a microeconomic level. The “economics” of rare events or “black swans” as they are called in the risk management literature has traditionally been underestimated or disregarded in developing countries. But, the impact especially as concerning GDP requires more extensive quantification (Olabeerria, 2010). Also, there is a variance in the impact per episode; different agents, different impact. This implies a concern for more differential and deliberate assessment of the risk of each of these episodes and agents.

This “crisis of epidemics” according to public health experts will continue and most probably centered in the largest emerging economies, those of Asia and Africa, with Africa the most vulnerable to the infectious disease impact. This forecast is based upon inadequate public health infrastructure, unequal and ill-prepared service centers, and lack of education. The cost will be substantial and persist for decades, and unlike other disasters such as those caused by war or weather is not recoverable. But, due to the reservoir of natural resources in Africa, it will continue to be a target for economic investment. The approach to date has focused on short term and reactive based upon episode vs. long term and strategic in focus.

The Institute of Medicine (2003) report entitled “The Emergence of Microbial Threat” identifies 12 factors that will perpetuate the enhanced role of microbes. Several of those factors are directly the result of commercial urbanization including disruption of ecosystems, international travel and commerce, economic development and land use, as well as technology and industry. Some of the factors are more indirect or secondary contributors such as the lack of political will, inadequate public health infrastructure, poverty, and microbial adaptation (Figure I).

**FIGURE 1**

<b>FACTORS CONTRIBUTING TO THE EMERGENCE OF MICROBIAL THREATS</b>	
<b>#1 Microbial Adaptation</b>	evolutionary ability of microbes to resist drugs and vaccine development
<b>#2 Human Vulnerability</b>	susceptibility to infection due to genetics, malnutrition and promiscuous use of antibiotics
<b>#3 Climate and Weather</b>	transmission, replication, movement and evolution of microbes impacted
<b>#4 Changing Ecosystems</b>	altered environments due to development influence transmission of infective agents
<b>#5 Economic Development and Land Use</b>	commercial development causing adverse impact with human/animal contact increase
<b>#6 Technology and Industry</b>	advances in medical technologies creating new pathways for infectious transmission
<b>#7 International Travel and Commerce</b>	broader dissemination of pathogens and vectors worldwide
<b>#8 Breakdown of Public Health Measures</b>	inadequate funding and lack of infrastructure and support
<b>#9 War and Famine</b>	displacement caused by war and malnutrition contributes to emergence and disease spread
<b>#10 Lack of Political Will</b>	commitment of leaders worldwide to commit to shared responsibility
<b>#11 Intent to do Harm</b>	threat of deliberate biological attacks causing social disruption
<b>#12 Poverty and Inequality</b>	creation of social unrest and desperation

*Microbial Threats to Health: Emergence, Detection and Response (IOM, 2003)*

## **EPIDEMICS IMPACTING GLOBAL BUSINESS**

The most significant recent epidemics with direct global economic impact are AIDS, SARS, Bird Flu, Swine Flu, and Ebola.

### **AIDS (Acquired Immune Deficiency Syndrome)**

Evidence from AIDS, one of the most destructive epidemics, shows how difficult it is to calculate the long-term economic effects of infectious outbreaks. One might expect to see a marked slowdown in the worst-hit countries, given its deadliness and its concentration among sexually active adults. Yet most studies to date have shown an annual loss of around 1% in GDP, with a death toll of 39 million (Liu, 2004). But because AIDS has primarily been found to be treatable with pharmaceutical agents and education and requires close personal contact, the disease has been mitigated.

### **SARS (Severe Acute Respiratory Syndrome)**

SARS' impact in 2003 was almost immediate. International agencies such as the International Monetary Fund (IMF) quickly became involved due to the havoc this epidemic exhibited on commerce with company closings to prohibit transmission and the impact on transportation. First detected in China, SARS, caused analysts to cut growth forecasts for Asian economies. Joan Zheng of J.P. Morgan Hong Kong, predicted that the local economy would shrink in the first half of 2003, and grow by only 1.6% for

the year. Before SARS, she expected 3.2%. FDI (Foreign Direct Investment) fell 62% (Tam, 2003). Since the disease first surfaced, there have been more than 2,700 cases and 100 deaths, 90% of them in Asia. The Cambridge Research Firm, Bio Economic Research Associates, has estimated SARS cost \$100 billion, giving it the dubious distinction as one of the costliest environmental events (Aoki, 2003). The agent was spread from Asia globally.

A factor that added to the impact and spread of this epidemic was the delayed response due to the closed nature of the Chinese government and the refusal to participate in the epidemic curtailment. This communication block is another risk in emerging markets and the failure to cooperate with agencies such as the WHO and the CDC contributing to a previously unrecognized economic risk (Greenfield, 2015).

### **Bird Flu**

The highly pathogenic avian influenza has been causing global concern as a potential pandemic threat. The virus has killed millions of poultry in a growing number of countries throughout Asia, Europe, and Africa. Health experts are concerned that the coexistence of human flu viruses and avian flu viruses provides the genetic mutation due to exchange between species and has the potential for creating a new more lethal strain. Since the first outbreak in 1987, there have been an increasing number of bird-to-human transmissions, leading to fatalities. The virus does not easily cross over to humans, though human to human transmission is uncertain. Millions of birds have become infected with the virus and 359 people have died in twelve countries (WHO, 2014).

### **Swine flu**

Swine flu is an infection caused by any one of several types of swine influenza common throughout pig populations. Transmission of the virus from pigs to humans is not common and does not always lead to disease. People with regular exposure to pigs are at increased risk. The current flu is attributed to the original virus from the 1918 outbreak of the virus and has circulated in humans, and thought to contribute to the normal seasonal epidemics of influenza. Outbreaks in swine are common and cause significant loss to the industry and are estimated to cost the British meat industry about £65 million every year (Greenfield, 2015).

### **Ebola**

Director General of Health for the WHO, Margaret Chan (2014) labels Ebola “one of the worst epidemics in modern times”. The world is unprepared for any global pandemic that is boundary less in scope and that is severe, sustained and threatening. The first case in March of 2014 had been estimated to have extrapolated to 21,000 cases by September. This lack of preparedness persisted despite the lessons learned from the SARS epidemic and despite urging by the WHO. Businesses around the globe were affected with the mining, agricultural and energy sectors most at risk.

Suppliers, who had to shut down, disrupted transportation and supply networks causing a problem for many companies and organizations. The outbreak that began in Guinea and spread to Liberia, Sierra Leone and Nigeria had claimed lives and prompted quarantines, flight cancellations, and business disruptions. John Rose, Annapolis, Maryland-based chief operating officer of risk management information and consulting firm iJET International Inc., said travel and logistical networks are particularly sensitive to disruption by a pandemic such as Ebola (Rose, 2014).

## **BUSINESS CONCERNS & IMPACT OF EPIDEMICS**

There are a number of factors typically impacted by disruptions in business operations which can be attributed to supply chain risk. Following is a discussion of these factors identified by risk management models such as those of Mitroff and Pearson (1993) and their crisis management planning. They include travel & employee protection, transportation and ports, supplier quality, corruption & compliance. Also is a consideration of supplier sourcing and disruption of communication and isolation.

### **Travel & Employee Protection**

A major impact is on travel of tourists and employees. Few want to travel and risk catching a disease or being quarantined. The impact is felt as people avoid stores, markets and restaurants. Workers stay home, impacting productivity and delaying customer orders. This indirect impact is added to the medical costs of treating victims and implementing disease control. The full cost of outbreaks depends on how long it lasts and how far it spreads.

### **Transportation & Ports**

In the event of an epidemic, there is a disruption in transportation due to multiple factors including work force shortage, isolation and quarantine efforts to contain the infectious agent as well as connecting infrastructure interruptions.

### **Supplier Quality**

Anything that jeopardizes the supply chain immediately impacts the quality of components and labor performance for the manufacturing, assembly and distribution of products. Of concern is the “shortcuts” taken when suppliers are understaffed and quality is compromised.

### **Corruption & Compliance**

The feasibility of corruption and violation of regulatory compliance are facilitated by the pressure of shortages and the incentives to capitalize on the situation. The impact is not only on quality of the product but also the potential harm to consumer not to mention reputational damage.

### **Supplier/Multiple Sourcing**

The concerns of supply chain risk management and the ultimate decision for foreign direct investment (FDI) consideration has been on the sourcing characteristics and disruption of the supply chain; supply sourcing, supply management and absorptive characteristics (Bagchi, 2014). Models of risk management also consider the value chain as identified by Porter (1986) to insure that the supporting administrative, human resources, as well as technology are in place to insure continuity.

### **Communication**

Interruptions in communication and a restriction of information flow challenge already complex global operations. This is further complicated by the incomplete as well as variety of information technology infrastructure within and between countries. Furthermore, not only is communication and the unrestricted flow of information caused by physical disruption such as those caused by quarantine and embargos, but also governmental suppression of information contributes to this risk. This was seen in the SARS epidemic by the Chinese government as to not limit the economic impact of tourism leading to not only lack of but also false and potentially damaging information (Day et. al., 2003). Communication disruption also results in isolation as well as contributing to fear.

## **RISK MANAGEMENT & INFECTIOUS DISEASE /EPIDEMIC ASSESSMENT & CONCERNS**

### **Health Care Infrastructure**

Health systems in emerging economies are largely dysfunctional and unprepared to handle an epidemic such as SARS or Ebola. Because there is little or no enforcement of public health recommendations, the rate of epidemics is predicted by the CDC to perpetuate at an increasing rate. Because of urbanization, the customary boundaries that have isolated epidemics to rural or even tropical vegetative areas have been breached and removed by the creation of roads and bridges which now facilitate the movement between localities at an increasing rate and without the natural barriers which have in the past limited the spread of these infectious agents and contained contaminated segments of the population. So the compounding increasing rate with the lack of confinement further exacerbated by the lack of health care infrastructure only enhances and fuels pathogen virulence and infection rates.

## **Zoonosis**

Further consideration is the very transmission and the quick mutation rate of these infectious agents, many transmitted in rural areas between animals and man, transmission known as zoonosis, and thus the interspecies barrier, once broken, accelerates the potential for pathogen mutation making vaccines and target drug more difficult to produce in sufficient quantities to halt the spread of the infectious disease. The CDC reports that the more virulent strains modeling underestimate the reporting by a factor of 2.5 (CDC, 2014).

## **CORPORATE RESPONSIBILITY IN EPIDEMICS**

The risk management of global business now includes not only a geopolitical consideration primarily due to wars and border disputes, but also the planning for epidemics which cause the same disruptions of business but are of a higher level of risk as they impact the supply chain, workers, as well as markets. With this said, there has been an increased role of global economic forces in creating a sense of urgency and responsibility for the participants in global commerce. In particular the World Bank (2014) in a new report has issued a series of recommendations for international partners, including business. These are the recommendations:

1. Support for local humanitarian efforts to finance medical equipment
2. Strengthen the surveillance, detection and treatment capacity of health systems. The time to build the infrastructure for health care in these emerging economies is not during the epidemics, but before they occur. With the predictability of future outbreaks, companies need to consider their role in assisting and engaging in these activities as part of the conditions of their FDI in country.
3. Provide infrastructure and financing countries international transportation links.
4. Help bridge the fiscal gap created by epidemics (approximating 290 million in 2014).

## **WHAT ELSE COMPANIES CAN DO**

In addition to the World Bank recommendations of increased participation in limiting the adverse impact of epidemics on the global economy, there are some immediate initiatives that businesses can undertake. The first is in the extension of risk management to include assessment of business operations & supply chain impact specifically to include infectious disease. Secondly, CS&A (2014) recommend the creation of an Epidemic Crisis Team, moving beyond the role of a Health Officer to a coordinated effort between operations and human resources. Other considerations are clearly defined global business objectives, monitoring of travel, enhanced employee communication and education, and redundancy planning in logistics (Sisk, 2003).

Day (2004) recommends initiatives centered on the free exchange of information to counteract the lack of clarity and potential localized communication lapse through the ongoing and specific monitoring of high impact work disruption factors such as:

1. prevention of inadequate inventory
2. diversified sourcing
3. enhanced or increased use of technology for communication
4. employee education and training for localized operations
5. human resource initiatives for worker protection primarily aimed at prevention of corruption (pp. 829-830).

## **GOVERNMENTAL & AGENCY INTERVENTION**

To date, most of the agency involvement in epidemics has centered on disease prevention and public health headed by the WHO and CDC. It is now evident that the economic ramifications of these diseases, especially in emerging economies with the resulting impact on the United States and other industrialized nations' economies requires another level of coordination and intervention.

An initiative external to business operations is participation in lobbying at the federal level for enhanced consideration of the economic impact of epidemics on the economy. The Obama administration appointed Ron Klain, a businessman and President of Case Holdings, and a former Chief of Staff to assume the role of “Ebola Czar” (WSJ, 2014), as an acknowledgement that the approach to global epidemics was inadequate. This appointment as a marriage of government and business is essential and needs to be ongoing, not a limited reaction to a single epidemic retrospectively, but a proactive and prospective responsibility of a public/private partnership, guarding against further disruption and limiting the economic impact of epidemics which transcends global boundaries. Corporate responsibility requires a global reach to address all three components of the “triple bottom line”, people, planet and profit, the components of sustainable business practices (Epstein, 2008).

## RECOMMENDATIONS FOR FUTURE RESEARCH

Lessons are to be learned from the cumulative effects of epidemics on global business. Although there have been a series of epidemics with demonstrated consequences, companies are still behind in the crisis management and modification of risk management models to identify and include epidemics in their framework. Further research on multinational corporations and assessment of their state of preparedness is needed to ascertain best practices and to implement strategies to minimize the impact of infectious agents and their resulting epidemics. Since we know that each epidemic has unique factors and impact, judicious study of epidemics and impact needs to be developed to develop a portfolio of responses to further mitigate risk.

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