

## When the Buzz Bites Back

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SARS is the story of not one epidemic but two, and the second epidemic, the one that has largely escaped the headlines, has implications that are far greater than the disease itself. That is because it is not the viral epidemic but rather an "information epidemic" that has transformed SARS, or severe acute respiratory syndrome, from a bungled Chinese regional health crisis into a global economic and social debacle.

SARS, as is well-known, has taken a heavy toll with more than 7,100 reported victims worldwide and more than 500 reported deaths so far. But the consequences of the related "epidemic" have been more far-reaching than the underlying disease and, quite possibly, more costly, affecting the lives of millions. What is more, the information epidemic -- or "infodemic" -- has made the public health crisis harder to control and contain.

What exactly do I mean by the "infodemic"? A few facts, mixed with fear, speculation and rumor, amplified and relayed swiftly worldwide by modern information technologies, have affected national and international economies, politics and even security in ways that are utterly disproportionate with the root realities. It is a phenomenon we have seen with greater frequency in recent years -- not only in our reaction to SARS, for example, but also in our response to terrorism and even to relatively minor occurrences such as shark sightings.

Over the past two years, information epidemics have left many airlines and the global tourism industry in intensive care. But their future effects may be greater still. Unchecked, they could usher in a period of profound new forms of economic inefficiency, opportunities for the irresponsible and for demagogues to practice new forms of social disruption or manipulation, and a set of serious new problems for policymakers dealing with challenges from public health to international affairs.

Infodemics are emerging as one of the most virulent phenomena known to man, able to transit continents instantly. In virtually every respect they behave just like any other disease, with an epidemiology all their own, identifiable symptoms, well-known carriers, even straightforward cures. Yet to date many in power seem unable to contain them or unwilling to acknowledge their existence.

These Internet- or media-borne viruses create global panics, trigger irrational behavior, blur our vision of important underlying problems, strain our infrastructure, buffet markets and undermine governments. Managed and understood, however, the forces that fuel infodemics can help us create better early warning systems for everything from diseases to social unrest, as well as respond quickly and monitor the results. Ultimately, they can help us reduce the number of distortional and destabilizing outbreaks of the types we have recently seen.

An infodemic is not the rapid spread of simple news via the media, nor is it simply the rumor mill on steroids. Rather, as with SARS, it is a complex phenomenon caused by the interaction of mainstream media, specialist media and internet sites; and "informal" media, which is to say wireless phones, text messaging, pagers, faxes and e-mail, all transmitting some combination of fact, rumor, interpretation and propaganda. It can be rendered more difficult to understand by multiple languages, cultures and attitudes toward the free and open flow of information. It involves consumers of information ranging from officials to private citizens who have varying abilities to see the whole information picture, varying degrees of sophistication about what to do with the information they have, little opportunity to authenticate data before acting on it, and little if any training in understanding or controlling the rapidly changing information picture. (Evidence of the current infodemic's potency came last week with the news that the Chinese government had detained four people for spreading rumors about SARS.)

The result is distortion, confusion and a sometimes profound incongruity between the underlying facts and their implications. For example, without minimizing the potential danger posed by SARS, it is worth remembering that the number of deaths from the disease worldwide is still a tiny fraction of, say, the number

of Americans who choke to death each year on small objects, which is estimated at 4,700. Yet, fear of the disease has devastated Asian economies. The Asian Development Bank estimates that if SARS continues until September, associated losses in that part of the world alone could approach \$30 billion. Some Wall Street analysts have speculated that the disease could lead China to devalue its currency. That country's economy grew 9.9 percent in the first quarter of this year; it might actually contract in the second quarter. The list of casualties is long.

SARS represents but one recent example of this phenomenon. Consider the not fully understood economic and social impact of changing homeland security threat levels in the United States. It is interesting to note that in 2002, the year of the most heightened state of terrorism panic in our history, according to the State Department, worldwide terrorism fell to its lowest level since 1969. Other examples include the economic impact of the sniper attacks in Washington (even though the number of deaths in the region was not appreciably altered by the scare), the effect of the threat of war in the Gulf on travel to the Mediterranean, even the impact of the Enron scandal on markets. Indeed, increased market volatility is one symptom of these newly virulent information epidemics.

Individuals, companies and entire countries can acquire some natural immunity to infodemics by cultivating credibility, something China sorely lacked even going into the SARS crisis. Moreover, the SARS case revealed another serious and solvable problem: Government public health epidemiologists are not information epidemiologists, and their tools for controlling biological epidemics (which might offer useful analogies for controlling information epidemics) are superior to those used against what is often the more dangerous electronic analogue.

So what should have happened in China? Understanding the nature of modern information flows could have allowed Beijing to contain the panic before it got out of hand. (Of course, also essential is effective public health care, which was lacking in this case in China.) For example, the World Health Organization received its first, vague report of a flu-like disease in mainland China on Nov. 27 of last year, via a system that is supposed to provide early warning of health threats. During the ensuing month, the outbreak, which probably occurred in the Pearl River Delta region, triggered rumors and panic (apparently spread by text messaging, cell phones and pagers). Public health officials refused to acknowledge the outbreak. Citizens began buying medicines and disinfectants such as white vinegar based on the rumors. Indeed, the vinegar, normally 50 cents a bottle, was going for as much as \$18 in some parts of Guangdong Province. As early as Jan. 3 of this year, the problem was knowable to anyone, anywhere in the world who had access to local Chinese media, many of which are available online. On that day, the Heyuan News ran an official report denying there was any reason to panic. Naturally, this triggered both more panic and further news reports, including one in Nanfang Dushibao, a leading Guangzhou newspaper.

My company tracked these reports and on Feb. 9 offered an analysis to our clients in the U.S. defense community regarding the outbreak. Our information was then posted on ProMED, a Federation of American Scientists Web site well-known in the medical community as a source of information about emerging diseases. Significantly, at that point ProMED had virtually no information about the disease. As reports like ours began to appear, the Chinese government informed the World Health Organization (WHO) of the disease; it was a step that one WHO official said seemed designed not to disclose the extent of the problem but rather to assert that it was under control. At about the same time, ironically, WHO received informal reports of a disease in Guangdong that had triggered panic, had left 100 dead and was "not allowed to be made public."

Clearly, had more been done earlier to effectively and more honestly manage not only the disease but also the information flows about it, the worldwide panic might not have taken place. Unfortunately, the disease spread, claiming its first Western victim in late February, which provided a better hook for Western media. That, in combination with the self-fueling nature of such stories (that which is already news is most likely to get future coverage), led to the global spread of the infodemic far beyond the location of known SARS victims, which in turn set off a chain reaction of economic and social consequences.

Yet if information is the disease, knowledge is also a cure. We should react to infodemics just as we do to diseases. Understand how these ideas are introduced into the population, how they spread, what accelerates their spread, what their consequences are, and what localized outbreaks may be contained. That does not

mean repressing information. It means effectively managing each outbreak and presenting the facts fully and quickly to critical audiences.

There are simple, practical steps that might help public officials and business people anticipate such problems. Carefully monitor the Web -- and with it, local media -- for information about outbreaks. Don't wait for major public organizations to announce a threat. Realize that using new technologies as an early warning system can be more difficult in societies such as China, where people posting messages on Web bulletin boards often disguise information from prying eyes. Recent online messages regarding the then-unpublicized sinking of a Chinese submarine, for example, initially referred to the loss of a Zimbabwean submarine so as to reduce the likelihood the government would quash the discussion. (Landlocked Zimbabwe has no submarines.) So, experienced interpretation is necessary. Finally, recognize that poor societies with the greatest public health needs also have the most primitive information technology infrastructures and least sophisticated government information technology capabilities.

What is clear, however, is that this phenomenon is only going to grow more complex. In the information age, life has changed fundamentally. Increased volatility is routine; events and information about them unfold rapidly; their consequences are amplified. The results are much like a roller coaster ride: exciting, scary, disorienting and all rather different from the view from more solid ground. Of course, there are benefits as well. Early warning is one. But perhaps the greatest is that these changes are going to make it much more difficult for governments like China's to contain "outbreaks" of information. While SARS has had devastating consequences in one Chinese province, with repercussions worldwide, the infodemic it triggered may also ultimately prove fatal to China's efforts to continue to operate a closed society in a world that has developed powerful antibodies against such pathologies.

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