Fear, Flight, Frustration and Dedicated Service: A Brief History of International Disease Control Activities, 1918-2008

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ABSTRACT

Comparing and contrasting the history of local, national and international efforts to control pandemic influenza in 1918-20 and SARS in 2003 provides an opportunity to assess the impact of disease on the international order. The great flu pandemic of 1918-20 occurred at the end of the First World War and highlighted the lack of well-organised public health services around the world. It also prompted sustained scientific research to determine the viral nature of influenza. In 1948, the World Health Organization was created as an international data collection agency whose role was to provide information in advance of disease outbreaks as well as to work to eradicate malaria, smallpox, polio and HIV/AIDS. But persuading member states to report outbreaks of communicable diseases was never easy. The SARS epidemic in 2003 illustrated the speed with which an unknown disease could travel around the world and the different approaches that nation states took to control and eradicate it. In Canada, history was used as a guide to choosing specific control measures. But Internet links to experts in Hong Kong, Atlanta and Geneva were also vital in stemming the outbreak. The lessons learned demonstrate the profound impact of disease on international order.

INTRODUCTION

What role does studying the history of epidemics play in enhancing our understanding of nations and empires? Similarly, how do health threats fit in traditional diplomatic history or policy making? Is health security a national or an international priority? And in the 21st century with its opportunities for the rapid transmission of communicable diseases will the agencies and approaches that were so slowly crafted during preceding centuries continue to suffice? Will nation states willingly participate in supranational efforts to stem the tide of disease? And even if they do, does humanity have the capacity to meet the challenge posed by ever-mutating microorganisms?

To answer these questions, a comparative review of the 1918-1919 flu pandemic and the 2003 SARS epidemic will be used to demonstrate the many factors which influence nations as they grapple with severe outbreaks of infectious disease. In general as many historians have argued, local and national responses to epidemics from the Black Death to the present reflect existing scientific knowledge, cultural beliefs and practices and the power of the state to impose preventive

or curative measures such as quarantine or isolation.[1] But were influenza and SARS imported or endemic? Should nations regard them with the same fear that was felt for cholera, plague and yellow fever in preceding centuries? What best practices would ensure that limited human and institutional resources were used to greatest effect since the 1918-19 pandemic coincided with the final months of the First World War while SARS was coterminous with the war in Iraq?

The similarities and difference between the two outbreaks reveal the importance of historical understanding of local, national and regional approaches to controlling communicable disease in a global context. Although efforts to establish international regulations had occurred prior to 1914, the First World War effectively prevented co-operation among the combatants. As a result, each nation or colony had to rely on local laws and existing health personnel for action to contain the outbreak and care for sufferers and their families. In contrast, the SARS epidemic occurred in a world linked through air travel and the Internet which enabled the World Health Organization (WHO) to take a leadership role on behalf of its 193 members to assist those countries who were suffering disease outbreaks. What changes in international diplomacy, biomedical knowledge and public attitudes had occurred to legitimise global action against a communicable disease? Does this portend a new definition of global health as a public good that must be available to all? By comparing and contrasting the international dimensions of the 1918-1919 influenza pandemic with the SARS outbreak in 2003, we will see how various nations and their peoples responded to the challenge of controlling communicable disease and the impact of these experiences on biomedical science, national health systems and international order. Starting first with the influenza pandemic, we will then examine the contested interwar attempts to create

1 There is a growing literature on the role of epidemics in history. Among the most influential studies are Charles E. Rosenberg, The Cholera Years: The United States in 1832, 1849 and 1866 (Chicago and London: University of Chicago Press, 1962); Charles E. Rosenberg, Explaining Epidemics and Other Studies in the History of Medicine (New York: Cambridge University Press, 1992); R.J. Morris, Cholera 1832: The Social Response to an Epidemic (London: Croom Helm, 1976); Margaret Pelling, Cholera, Fever and English Medicine, 1825-1865 (Oxford: Oxford University Press, 1978); Geoffrey Bilson, A Darkened House: Cholera in Nineteenth-Century Canada (Toronto: University of Toronto Press, 1980); Margaret Humphreys, "No Safe Place: Disease and Panic in American History," American Literary History 14 (2002):845-57; Caroline Hannaway, Victoria A. Harden and John Parascandola, eds, AIDS and the Public Debate: Historical and Contemporary Perspectives (Amsterdam: IOS Press, 1995); Nayan Shah, Contagious Divides: Epidemics and Race in San Francisco's Chinatown (Berkeley, CA: University of California Press, 2001); Howard Phillips and David Killingray, eds, The Spanish Influenza Epidemic of 1918-19: New Perspectives (London and New York: Routledge, 2003).

effective disease monitoring and control efforts, the discovery of the flu virus and its frightening ability to mutate, the creation and disease fighting function of the World Health Organization, and end with a discussion of the SARS outbreak and the way that it has affected global health.

PANDEMIC INFLUENZA, 1918-1919

The historiography of the 1918-19 pandemic focuses on national, regional and local responses to the disease, the scientific challenges which it posed, the difficulty of determining the worldwide death toll and the surprising absence of discussions of the outbreak's impact on the peace talks in 1919, and in long term collective memory.[2] To date little attention has been paid to its role as a catalyst for the expansion of international sanitary regulations during the 1920s beyond the limited group of European and American nations who had formed organisations such as the Pan American Sanitary Bureau (1902) and the *Office international d'hygiène publique* (1907).[3] In part this is likely due to the overwhelming nature of the crisis and the inability of states and the medical profession to determine whether the policies and practices which had evolved during the 19th century and been codified into the Sanitary Convention of 1912 were applicable to a disease such as influenza. The war was also a significant factor because trade and migration were disrupted and the sanitary regulations had been designed primarily to facilitate trade and to protect western nations from the threat of imported 'Asiatic' diseases such as cholera and plague.[4] As the discussion of the pandemic will illustrate, influenza in the fall of 1918 challenged all the experience and standard disease control measures which both military and civilian authorities around the world had traditionally used to combat outbreaks.

2 See John M. Barry, The Great Influenza: The Epic Story of the Deadliest Plague in History (New York: Viking, 2004); Eileen Pettigrew, The Silent Enemy: Canada and the Deadly Flu, 1918 (Saskatoon, SK: Western Prairie Producer Books, 1983); Eugenia Tognotti, "Scientific Triumphalism and Learning from Facts: Bacteriology and the 'Spanish Flu' Challenge of 1918," Social History of Medicine 16, No. 1 (2003): 97-110; K. David Patterson and Gerald F. Pyle, "The Geography and Mortality of the 1918 Influenza Pandemic," Bulletin of the History of Medicine 65, No. 1 (Spring 1991): 4-21; Niall P.A.S. Johnson and Juergen Mueller, "Updating the Accounts: Global Mortality of the 1918-1920 'Spanish' Influenza Pandemic," Bulletin of the History of Medicine 76, No. 1 (Spring 2002): 105-115; Howard Phillips and David Killingray, eds., The Spanish Influenza Pandemic of 1918-19: New Perspectives (London: Routledge, 2002); Howard Phillips, "The Re-appearing Shadow: Trends in the Historiography of the 1918-19 Influenza Pandemic," Canadian Bulletin of Medical History 21, No. 1 (2004): 121-134.
3 See David P. Fidler, SARS, Governance and the Globalization of Disease (New York: Palgrave Macmillan, 2004), 27-32 for a summary of previous scholarship.
4 Fidler, SARS, Governance and the Globalization of Disease, 28-29.

As John Barry and Carol Byerly indicate in their respective studies, influenza emerged in American military camps in Kansas in spring 1918.[5] Although the outbreak was generally mild, some victims suffered from a pneumonic form which turned their extremities blue (cyanosis) and produced massive nose bleeds and other haemorrhages. When this phase of the outbreak subsided, there had not been much spread of the flu to the civilian population in the US, but overseas, Allied troops and their enemies all began to suffer from the disease. During the summer of 1918, the virus increased in virulence and during the fall explosive outbreaks occurred in military camps in North America and overseas and quickly spread to the adjacent population. Beginning at Camp Devens outside Boston, the epidemic moved down the eastern seaboard to New York, Philadelphia and Washington before turning inland and moving north into Canada,[6] south to Texas and west through Chicago all the way to California. The disease struck so swiftly that available hospital space and health care personnel were overwhelmed. The military searched desperately for nurses, doctors, and orderlies while using the healthy and survivors for the grim task of attempting to bury the dead.[7] In major cities, local health departments were expected to control outbreaks of disease and they responded by implementing existing laws regarding quarantine and isolation, recommending that people wear gauze masks and avoid crowds, and in some instances closing schools, churches, theatres and other public gathering places, shortening hours of opening for businesses and urging the public to volunteer to help the ill. As the disease proved more and more deadly, local, state and provincial authorities created temporary hospitals, and used voluntary groups to prepare food in soup kitchens, deliver supplies to stricken households, drive the limited number of civilian doctors and nurses from patient to patient, and to raise funds for the poor and wage workers who were unable to work while they were ill.[8] Many also turned to groups such as their national Red Cross Societies for assistance and these non-governmental agencies responded although much of their

5 Barry, 169-70; Carol R. Byerly, Fever of War: The Influenza Epidemic in the U.S. Army During World War I (New York and London: New York University Press, 2005), 69-96.
6 Mark Osborne Humphries, "The Horror at Home: The Canadian Military and the 'Great' Influenza Pandemic of 1918," Journal of the Canadian Historical Association New Series 16 (London, 2005): 235-260.
7 Barry, 169-252.
8 Heather MacDougall, "Toronto's Health Department in Action: Influenza in 1918 and SARS in 2003," Journal of the History of Medicine and Allied Sciences 62, No. 1 (2007):56-89; Esyllt W. Jones, Influenza 1918: Disease, Death, and Struggle in Winnipeg (Toronto: University of Toronto Press, 2007).

attention was focused on suffering soldiers.

To countries immersed in total war, the influenza pandemic was an additional blow because not only did it affect recruitment and training but it also had a severe impact on war industries and the provision of food and other supplies for combatants and their allies. As the disease spread throughout the world, carried by troop ships taking casualties home or bringing new recruits to the western front, Africa and the Pacific nations were infected. Like the Europeans and North Americans, the mortality rate was striking. Normally influenza kills the elderly and the young but this pandemic strain showed a marked preference for men and women aged 20-40. The carnage of the war is estimated to have killed nine million but the flu epidemic is now thought to have destroyed 50-100 million people between 1918 and 1920. While acknowledging the sustained underreporting of influenza deaths, Niall Johnson and Juergen Mueller have calculated regional mortality based on material provided by recent scholarship which has broadened our understanding of the impact of the disease. In Africa, the death toll is estimated at 2,375,000 for a mortality rate of 18.20 per 1,000 but this hides the contrast between countries such as Cameroon with a population of 561,000 where 250,000 died as opposed to Kenya which lost 150,000 from a population of 2,596,000.[9] In India 18 million are thought to have perished and in China 4-9.5 million while in Europe, more that 2,300,646 succumbed for a death rate of more than 4.80 per 1000.[10] But as Johnson and Mueller remind us, these figures represent existing records and do not cover all communities. Equally important, since there was no standard nomenclature and agreed-upon definition of what constituted a death from influenza, existing statistics may contain deaths from pneumonia and other sequelae or may simply be underreported because health care and military personnel were too busy caring for the sick.[11]

Why was there such confusion regarding influenza? An ancient scourge which had erupted

9 Johnson and Mueller, 110. See also Barry, 359-365.
10 Ibid., 112-113.
11 Ibid., 115. Other authors also suggest that families may have all died with the result that there was no one left to report. Indigenous communities in Canada, Labrador and New Zealand were often destroyed as the disease killed all but small children. See Pettigrew, 24-33, 77-87; Mary Ellen Kelm, "British Columbia First Nations and the Influenza Pandemic of 1918-19," BC Studies 122 (1999): 23-45; Geoffrey W. Rice, "Japan and New Zealand in the 1918 influenza pandemic: Comparative perspectives on official responses and crisis management," in The Spanish Influenza Pandemic of 1918-19: New Perspectives, 74.

globally throughout the 19th century, influenza was usually viewed as a minor disease which killed the very young and the elderly while causing temporary discomfort for adults. During the preceding worldwide outbreak from 1889-90, various researchers including Richard Pfeiffer, Director of the Research Department at Berlin's Institute for Infectious Diseases, argued that flu had a bacterial origin and indeed Pfeiffer claimed to have discovered a microorganism, *Haemophilus influenzae*, that caused the disease. This apparent triumph of bacteriological research proved false as military and civilian pathologists failed to replicate Pfeiffer's findings in the 1905 flu and again in 1918-19. Even more disillusioning, attempts to create a therapeutic or prophylactic vaccine similar to either diphtheria antitoxin or smallpox vaccine failed in spite of the best efforts of military researchers and noted investigators like William H. Park of New York.[12] Clearly more research had to be done and during the outbreak, various military experts began to ask if the cause was a filterable virus.[13] This would prove to be a fruitful path but it required more time and expertise than was available during the pandemic.

The human cost of the epidemic was high. Young men (20-39) and pregnant women were particularly vulnerable and the mortality curve for the epidemic resembled the letter W rather than the usual U-shape. Added on top of the high casualty rate for the war, the loss of young adults meant that postwar governments faced the task of caring for orphans, widows and the elderly parents of the dead. They also faced the task of responding to critics who asked why Britain and Canada, for example, had lacked national health departments to provide appropriate guidance and financial support to hard-pressed cities, towns, counties and provinces.[14] As well noted public health experts such as Dr Victor Vaughan (United States) and Sir George Newman (Great Britain) lamented the inability of officials at any level to control or prevent the disease using the standard

12 Tognotti, 103-107; Barry, 266-80.
13 H.G. Gibson, F.B. Bowman and J.L. Connor, "A Filtrable Virus as the Cause of the Early Stage of the Present Epidemic of Influenza," British Medical Journal (14 December 1918): 645.
14 Both Great Britain and Canada, in fact, created their first national health departments in 1919. These ministries were expected to improve national health through measures to rebuild the population by controlling the spread of sexually transmitted diseases and tuberculosis. See Anne Hardy, Health and Medicine in Britain Since 1860 (London: Palgrave, 2001), 77 and Bill 11, An Act respecting the Department of Health, 2nd session, 13th Parliament, 1919 (assented to 6th June 1919), Statutes of Canada 1920, c. 24.

control procedures.

Perhaps the most realistic assessment of the ordeal was published as "A working program against influenza" in the January 1919 issue of the *American Journal of Public Health*. This committee report stressed the importance of action to combat outbreaks by observing that health agencies "must act in light of present knowledge" even if that knowledge was limited or flawed. Furthermore, these experts called for research into the cause of the disease, urged the development of an effective vaccine, and pointed out how severely their efforts had been hampered by lack of trained staff. They also commented on the importance of maintaining public morale and noted the difficulties of quarantine and isolation when families lacked the financial resources to cope with the loss of employment.[15]

Such concerns were not confined to North America as health officers around the world grappled with the human cost of the pandemic. Would there be long term health problems for the survivors? Would the epidemic return? What were the likely consequences for colonial empires whose indigenous peoples had been decimated by disease? Ironically, these questions were not addressed as other contagious diseases erupted at the war's end. Typhus spread in Eastern Europe as Lenin and the Bolsheviks succeeded in overthrowing the Russian monarchy. But the 1919 Peace Conference coincided with the third wave of pandemic influenza and both Colonel House and President Woodrow Wilson suffered from the disease,[16] leading some to question the disease's impact on world history. And in many nations the return of wounded, disabled and "shell shocked" soldiers brought home the reality of global warfare as citizens and nations sought to create a better world during the peace negotiations.

SCIENCE AND DISEASE CONTROL, 1919-1945

Originating from President Wilson's Fourteen Points, the League of Nations was intended to prevent future wars and to create a forum for international action on many issues, although health matters were not deemed a priority in spite of the influenza pandemic's impact.[17] Nevertheless, Article 23 subsection (e) of the League *Covenant* noted that members "will endeavour to take steps

15 "A Working Program Against Influenza," American Journal of Public Health 9 (1919):1-13.
16 Barry, 382-88.
17 Margaret MacMillan, Paris 1919: Six Months That Changed the World (Toronto: Random House of Canada Limited, 2001), 83-97.

in matters of international concern for the prevention and control of disease" while Article 25 stated "[T]he Members of the League agree to encourage and promote the establishment and co-operation of duly authorised voluntary national Red Cross organisations having as purposes the improvement of health, the prevention of disease and the mitigation of suffering throughout the world."[18] Would Article 23 (e) provide an opportunity to move beyond the quarantine and trade-based regulations administered by the *Office international d'hygiène publique* (OIHP)? Was Article 25 an American attempt to remould disaster relief and to professionalise international public health? Would the experience of battling influenza in 1918-19 influence the activities and practices of the new international body? To these questions we will now turn.

By attempting to expand collective security to encompass public health and disease control, the new League of Nations Health Organization (LNHO) found itself facing the entrenched interests of *OIHP*, the Pan American Sanitary Bureau and the *Comité international de la Croix Rouge (CICR)* as well as responding to the newly formed American-backed League of Red Cross Societies (LRCS). Each of these groups had its own mandate, beliefs, funding and supporters which made the LNHO's task highly complex as it sought to develop its role as a leader in international health matters.[19] The failure of the United States to join the League of Nations meant that it was not eligible to sit on the LNHO Advisory Committee. But since it was member of *OIHP* and that organisation sent delegates to LNHO meetings, the Americans maintained links to their European counterparts. The initial vision of shared progress in medical research, disease control and improving human health worldwide, however, was limited by the exclusion of Germany and Russia and the failure to persuade *OIHP* to unite with LNHO to form a single international organisation.

Nevertheless, the International Sanitary Convention of 1926 was adopted, followed in 1933 by the International Sanitary Convention for Aerial Navigation which recognised the role of air travel in the potential transmission of disease. The purpose of these conventions was to establish

18 The Avalon Project at Yale Law School, "The Covenant of the League of Nations," Yale University Law School, 1996, http://www.yale.edu/lawweb/avalon/leagcov.htm. (Accessed July 26, 2008).
19 See Bridget Towers, "Red Cross organisational politics, 1918-1922: relations of dominance and the influence of the United States," and Martin David Dubin, "The League of Nations Health Organization," in International health organizations and movements, 1918-1939, ed. Paul Weindling (Cambridge: Cambridge University Press, 1995): 36-55, 56-80.

international standards for quarantine and other disease control measures and thus limit conflict among nations as well as enhancing trade and travel.[20] But the LNHO was not simply prepared to focus on technical solutions and professionalisation of public health training during the interwar years. Under the dynamic direction of Polish bacteriologist, Ludwig Rajchman, the LHNO became "a worldwide clearing house which elevated public health values, institutions and practices…[and] directed international expert committees, technical commissions, and specialised conferences…"

It also set up a "Service of Epidemiological Intelligence and Public Health Statistics in Geneva, collected data on diseases not covered by the International Sanitary Convention, established the Eastern Bureau at Singapore to improve the collection and dissemination of regional data, and developed a system to communicate reports of epidemic diseases by radio and telegraph."[21] To ensure that the data collected was more useful than the fragmentary statistics available for the influenza pandemic, the LHNO created a standard nomenclature for officials, uniform reporting requirements and then produced standardised reports which enabled countries to compare the health status of their citizens with the rest of the world. This database became the foundation for the system currently used by the WHO. And like its successor, the LNHO responded to requests for assistance in controlling outbreaks of disease or developing modern methods of health administration and infrastructure in "the Balkans, Central Europe and Latin America, and China and Iraq."[22] It also encouraged professional exchanges and this activity was supported by the Rockefeller Foundation which provided training grants for foreign students to study at the schools of public health or tropical medicine and hygiene which it also funded.[23]

The LHNO also participated in the scientific advances which occurred during the 1920s and 1930s. Dr. Thorvald Madsen (Norway) and Sir Henry Dale (Great Britain) organised research in laboratories around the world to establish international standards for "antitoxins; sera; vaccines;

20 Fidler, SARS, Governance and the Globalization of Disease, 29-30.
21 Dubin, "The League of Nations Health Organisation," in Weindling, 59. See also Paul Weindling, "Social Medicine at the League of Nations Health Organization and the International Labour Office compared," in International health organizations and movements, 1918-1939, 134-153.
22 Dubin, 60.
23 For example, see P. A. Bator with A.J. Rhodes, 'Within reach of everyone:'A History of the University of Toronto School of Hygiene and the Connaught Laboratories, Volume 1, 1927-1955 (Ottawa: Canadian Public Health Association, 1990), 29-30.

hormones and vitamins" which were codified through the international convention of 1935.[24] While these developments were occurring, British researchers CH Andrewes, Patrick Laidlaw and Wilson Smith had identified the human pathogen in influenza virus in 1933 and in 1934 Dr. Tom Francis of the Rockefeller Institute isolated Influenza A, followed six years later by his discovery of Influenza B. Finally the knowledge necessary to prepare an effective vaccine was available.[25] But by 1940, the League of Nations had collapsed and the world was once again at war. Would the deadly flu reappear?

During the Second World War, combatant countries again experienced flu epidemics and in 1941 the American Armed Forces Commission on Influenza was established to study the problem. Would the end of hostilities see another pandemic? What should be done to reorganise international disease control efforts and public health initiatives? Discussions about these issues occurred in tandem with the creation of the United Nations and in 1946 a Technical Preparatory Committee was created to develop an international body which would subsume the work of *OIHP* and the League of Nations Health Organization. This body sent a representative to the International Congress on Microbiology in Copenhagen in July 1947 to consult experts on how best to respond to this disease threat. They recommended creating a World Influenza Centre to collect and distribute information, co-ordinate laboratory work and train technicians and scientists. This suggestion was adopted and the National Institute for Medical Research in London became the first World Influenza Centre, followed quickly by the addition of the US Strain Study Centre in New York as the source of information and research for the Americas. Together the two centres covered the globe and in conjunction with regional laboratories provided the first line of defense against future pandemics.[26]

THE WORLD HEALTH ORGANIZATION, 1948-2000

On September 1, 1948 the World Health Organization began its 60 years of service with a credo that stated:

24 Dubin, 60.
25 Robert D. Defries, The First Forty Years 1914-1955: Connaught Medical Research Laboratories University of Toronto (Toronto: University of Toronto Press, 1968), 194-96.
26 World Health Organization, The First Ten Years of the World Health Organization (Geneva, 1958), 212-15. By 1958, the Amercian centre was based at the US Centre for Disease Control Virus Laboratory in Montgomery, Alabama (subsequently moved to Atlanta) and there were sixty WHO-designated

- Health is a state of physical fitness and of mental and social well-being, not only the absence of infirmity and disease.
- The right to health is one of the fundamental rights to which every human being is entitled, without distinction of race, religion, political belief, economic or social condition.
- The fundamental freedoms can be obtained and maintained only when people are healthy, well nourished and protected against disease.[27]

How would this contribute to dealing with future pandemics of influenza or other diseases? How would the departure of the Soviet Union and its supporters in 1949 and the refusal to seat Communist China after the defeat of the Nationalists affect the WHO? With its regional structure and permanent secretariat based in Geneva, the WHO was expected to respond to the issues raised by members of the World Health Assembly while continuing to provide the medical statistics, expertise and assistance to countries battling epidemics or needing advice on training staff or administering national health systems. In 1951, WHO adopted the International Health Regulations "in an effort to consolidate the patchwork of international sanitary conventions in effect prior to World War II into one set of universally applicable rules."[28] It also set up an expert advisory panel on virus diseases and an expert committee on influenza in 1952.[29] Their task was to coordinate international research to prevent unnecessary duplication and to ensure that new knowledge regarding the disease was widely shared in the scientific and public health communities.

Through the first twenty years of the World Health Organization's existence, attention was focused on establishing the agency, combating outbreaks of typhus and cholera and beginning the campaign to use DDT and other modern methods to eradicate malaria. These highly scientific and technical programs were paralleled by increasing knowledge regarding the viral origins of influenza but pandemics of the "Asian" flu in 1957 and the "Hong Kong" flu in 1968-69 demonstrated the microorganism's ability to change its composition and its virulence and the

influenza centres in forty countries but with only two in South-East Asia and six in the Western Pacific, the system was incomplete.

27 John Farley, Brock Chisholm, The World Health Organization & the Cold War (Vancouver: University of British Columbia Press, 2008), 18-19.

28 David P. Fidler, SARS, Governance and the Globalization of Disease (New York: Palgrave Macmillan, 2004), 32.

29 WHO, The First Ten Years, 217.

ongoing challenge of obtaining accurate information about the initial cases of the disease from its point of origin.[30] Only members of WHO were required to report cases and governments were often slow to do so because, like their 19th century counterparts, they feared the economic consequences in terms of loss of trade and tourism revenue.[31] But recognition of the costs of hospital and post-outbreak care led to a revision of the international health regulations in 1969. These regulations remained in effect with minor changes until the end of the century when the appearance a new and old disease threats prompted WHO and its member states to review their procedures. With the appearance of HIV/AIDS in 1983, cholera in Latin America in 1991, further Ebola and Marburg outbreaks in Africa in 1992-93, and multi-drug-resistant strains of tuberculosis and sexually transmitted infections during the 1990s, it became clear that like trade, disease was globalising.[32] For WHO and its member countries the challenge was clear: how were these threats to be contained?

Like other agencies connected to the United Nations, the WHO was subject to international politics and the impact of the Cold War. Equally significant, however, were the internal division between those who supported biomedical, technocratic solutions to world health problems and those who saw the "vertical" focus on malaria and smallpox eradication as a failure to recognise the underlying class, gender and ethnic determinants of health.[33] The shift from biomedical solutions to primary health care occurred during the 1980s and led to internal conflict which

30 WHO, The First Ten Years, 219. "At the beginning of May 1957, news was received of extensive epidemics in Hong Kong and Singapore. Later information revealed that this epidemic began about the end of February in China in Kweichow Province and spread throughout China in March reaching Hong Kong about the middle of April. The delay in receiving this information re-emphasizes the importance of truly worldwide coverage in this programme." Since China was not a member of the UN in 1957, it was not eligible for membership in WHO.

31 Fidler, SARS, Governance and the Globalization of Disease, 33-4.

32 Theodore M. Brown, Marcus Cueto and Elizabeth Fee, "The World Health Organization and the Transition from 'International' to 'Global' Public Health," American Journal of Public Health 96, no. 1(January 2006):67-70.

33 Kenneth W. Newell, "Selective Primary Health Care: The Counter Revolution," Social Science of Medicine 26, no. 9 (1988): 903-906; Socrates Litsios, "The Christian Medical Commission and the Development of the World Health Organization," American Journal of Public Health 94, no. 11 (November 2004): 1884-1893; Maureen Law and Jean Larivière, "Canada and WHO: Giving and Receiving," Health Promotion 26, no. 4 (Spring 1988): 2-8, 16; Theodore M. Brown, Marcus Cueto and Elizabeth Fee, "The World Health Organization and the Transition from "International" to "Global" Public Health," American Journal of Public Health 96, no. 1 (January 2006): 62-72.

enabled other agencies such as UNICEF, the World Bank and the International Monetary Fund to subsume aspects of WHO's mandate in their programs.[34] But control of communicable disease provided the opportunity which WHO needed to regain its central role as avian flu in 1997 and the SARS outbreak in 2003 would convincingly demonstrate.

But underpinning this development was changing public perception of the risk of disease through global trade, tourism and migration.[35] Would modern governments have the capacity to respond to mass outbreaks after downloading responsibilities and cutting funding for health services in response to the application of neo-conservative economic theories? Which experts would determine the appropriate diagnostic tests and therapies? Would it be possible to produce sufficient quantities of vaccine to protect the vulnerable? If not, would less developed countries have access to the same services and support as Western nations? And if contemporary science could not provide a "magic bullet," what approaches would be implemented? All of these questions became pertinent in February-March 2003 when the WHO began to receive warnings about an atypical pneumonia which had appeared in China's Guangdong province, Hong Kong, Hanoi, Singapore and Toronto. Was this a new disease or the much feared reappearance of the 1918-19 flu?

SARS AND THE NEW GLOBAL ORDER

From February to July 2003, the World Health Organization was the focus of global media attention as it directed the campaign against SARS. Through its Global Public Health Intelligence Network (GPHIN) which had been developed by Health Canada in the mid-1990s, WHO used modern information technology to circumvent lax or late reporting of outbreaks of disease by its

34 George A. Silver, "Editorial: International Health Services Need an Interorganizational Policy," American Journal of Public Health 88, no. 5 (May 1998): 727-29; Jennifer Prah Ruger, "The Changing Role of the World Bank in Global Health," American Journal of Public Health, 95, no. 1 (January 2005): 60-70.

35 Andrew Nikiforuk, The Fourth Horseman: A Short History of Epidemics, Plagues, Famine and Other Scourges (Toronto: Penguin Viking, 1991); Laurie Garrett, The Coming Plague (New York: Farrar, Strauss & Giroux, 1994); Laurie Garrett, Betrayal of Trust: The Collapse of Global Public Health (New York: Hyperion, 2000); Andrew Nikiforuk, Pandemonium: Bird Flu, Mad Cow Disease, and Other Biological Plagues of the 21st Century (Toronto: Viking Canada, 2006).

members.[36] This system provided information about the disease in Guangdong in November 2002 which led WHO to alert the members of its Global Outbreak Alert Response Network (GOARN) to the possibility of an influenza outbreak since avian influenza had erupted in 1997 and might have mutated into the same H1N1 strain thought to have caused the pandemic in 1918-19. After the Chinese authorities finally reported the atypical pneumonia cases and deaths to WHO's Western Pacific Regional Office in Manila on February 10, 2003, the situation escalated quickly when family-based cases of avian flu (H5N1) were confirmed in Fujan province on February 19. Simultaneously cases of atypical pneumonia appeared in Hanoi and Hong Kong with the result that on March 12 WHO issued a global alert regarding a new threat to human health: fatal atypical pneumonia. By March 15 WHO had received reports of 150 new cases including cases in Canada which indicated that the disease traveled by air and this prompted the first global travel advisory. By April 15, 2,781 cases and 111 deaths had occurred in 17 countries on three continents. Most of the ill and the dead were health care personnel and index patients and their close relatives. But the impact was worldwide as trade diminished, travel to affected areas collapsed, and the "worried well" flooded health care facilities in countries which were not gravely affected by the disease.[37]

The main WHO office in Geneva coordinated an international research program to find the cause of the disease and within a month the coronavirus which is thought to cause SARS had been identified. Less success occurred in finding an appropriate therapy as the drugs used did not readily assist patients. Isolation of the sick, prompt use of personal protective equipment and careful tracing of index cases and their contacts became the most effective way to contain the disease. Among the most striking aspects of the outbreak was the way that various societies responded to SARS. In Taiwan, Viet Nam and Singapore, the governments worked with WHO expert teams to control the outbreak in hospitals while imposing stringent measures on their civilian populations.[38] In Canada, Toronto was the epicenter of the outbreak and its Health Department aided by staff from across the country and the US undertook to trace contacts and supervise quarantine of nearly

36 Eric Mykhalovskiy and Lorna Weir, "The Global Public Health Intelligence Network and Early Warning Outbreak Detection: A Canadian Contribution to Global Public Health," Canadian Journal of Public Health 97, No. 1 (Jan/Feb 2006): 42-44.
37 WHO Western Pacific Region, SARS: How a global epidemic was stopped (WHO: Geneva, 2006), 1-49, 185; Angela R. McLean et. al., SARS: A Case Study in Emerging Infections (Oxford: Oxford University Press, 2005).
38 WHO Western Pacific Region, SARS, 71-125.

30,000 citizens during both phases of the outbreak. Only 75 notices had to be issued as the majority of citizens accepted their 10-day quarantine period as a duty to society.[39] In China, authorities initially denied the existence of the outbreak but after WHO unequivocally condemned the lack of transparency and action in the world press, the government swung into action and used local community groups to control the outbreak.[40] When the final statistics were released, 95% of the 8,096 cases worldwide had occurred in 12 countries of the Western Pacific Region with mainland China having 5,327 cases, 2,521 of which had occurred in Beijing. Toronto was the second largest site for cases with 247 and 44 deaths.[41]

As commentators at the time and since have stated, the global death rate from SARS was small compared to that from malaria, measles, tuberculosis and HIV/AIDS. True as this is, SARS was a dress rehearsal for a possible influenza pandemic and the lessons that it taught are important for individual nations and for world health. The shortcomings of limited public spending on prevention and disease control measures were obvious to all of the nations involved in the outbreak as they set up expert commissions to examine the event.[42] For the World Health Organization, SARS put the revision of the 1969 International Health Regulations at the top of the World Health Assembly agenda as WHO's leadership had been challenged because of the impact of its alerts and travel advisories on the economies of the countries that were, in effect, quarantined. Canada, in

39 Sheela V. Basrur, Barbara Yaffe, Bonnie Henry, "SARS: A Local Public Health Perspective," Canadian Journal of Public Health 95, No. 1 (Jan/Feb2004):22-24; Clete DiGiovanni, Jerome Conley, Daniel Chu and Jason Zaborski, "Factors Influencing Compliance with Quarantine in Toronto During the 2003 SARS Outbreak," Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science 2, Number 4 (2004):265-272; Maureen A. Cava et al., "The Experience of Quarantine for Individuals Affected by SARS in Toronto," Public Health Nursing 22, No. 5 (2005):398-406.

40 Alan Schnur, "The Role of the World Health Organization in Combating SARS, Focusing on the Efforts in China," in SARS in China: Prelude to Pandemic? ed. Arthur Kleinman and James L. Watson (Stanford, CA: Stanford University Press, 2006), 31-5; Fidler, SARS, Governance and the Globalization of Disease, 93-99.

41 WHO Western Pacific Region, SARS, p. 185.

42 In Canada there were three commissions, one federal and two provincial. The federal advisory committee report, Learning from SARS: Renewal of Public Health in Canada – A Report of the National Advisory Committee on SARS and Public Health (Ottawa: Health Canada, 2003), recommended the creation of a public health agency similar to the American Centres for Disease Control and this occurred in 2005. See http://www.hc-sc.gc.ca/english/protection/warnings/sars/learning for the report and http://www.phac-aspc.gc.ca for information about the Public Health Agency of Canada and its duties. Canada also revised its quarantine act and various provinces have updated their public health legislation to respond to disease threats. All have prepared pandemic plans available on provincial health ministry web sites.

particular questioned the justification for the travel ban when it appeared that the disease was contained and diminishing. Other nations were equally interested because the Asian economies lost nearly $60 billion as a result of the epidemic. Could such disruptions be prevented or mitigated?

In 2005 the revised International Health Regulations were presented to WHO members. The new regulations demonstrate how far the world has advanced since the 1918-19 pandemic because the WHO is now to be advised of "all public health emergencies of international concern," member nations are subject to more extensive surveillance and response obligations through mandatory reporting, WHO may use non-official sources as the basis for sharing information and it is to make recommendations about control measures that members states are expected to meet or exceed.[43] As David Fidler, Ilona Kickbusch, Nick Drager and other experts argue, global public health has become an important aspect of international/global diplomacy.[44] New disease threats require all nations to prepare to respond either by ensuring that their surveillance programs pick up the necessary information or by producing and stockpiling essential vaccines or supplies and maintaining adequate health personnel and infrastructure. But they must also continue to examine the way that the determinants of health affect global migration and trade since the free movement of people and goods provides a vector for disease. As Kelley Lee points out: "The speed of modern transportation systems means that infections can potentially move around the world within a few hours (as illustrated by the SARS outbreak in 2002-03). On the other hand…an international

43 Kumanan Wilson, Christopher McDougall, David P. Fidler and Harvey Lazar, "Strategies for implementing the new International Health Regulations in federal countries," Bulletin of the World Health Organization 86, No. 3 (March 2008): 215-220; Kumanan Wilson, Barbara von Tigerstrom, Christopher McDougall, "Protecting global health security through the International Health Regulations: requirements and challenges," Canadian Medical Association Journal 179, No. 1 (July 1, 2008): 44-48; WHO News, "New rules on international public health security," Bulletin of the World Health Organization 85, No. 6 (June 2007): 428-430.

44 David P. Fidler, "Reflections on the revolution in health and foreign policy," Bulletin of the World Health Organization 83, no. 3 (March 2007):243-44; Ilona Kickbusch, "The development of international health policies – accountability intact?", Social Science and Medicine 51 (2000): 979-989; Ilona Kickbusch, "Mapping the Future of Public Health: Action on Global Health," Canadian Journal of Public Health 97, No. 1(Jan/Feb 2006): 6-9; Ilona Kickbusch, Gaudenz Silberschmidt and Paulo Buss, "Global health diplomacy: the need for new perspectives, strategic approaches and skills in global health," Bulletin of the World Health Organization 85, No. 3 (March 2007): 230-32; Nick Drager and David P. Fidler, "Foreign policy, trade and health: at the cutting edge of global health diplomacy," Bulletin of the World Health Organization 85, No. 3(March 2007):162

network of institutions coordinated by the World Health Organization (WHO) via global telecommunications can readily detect and rapidly respond to changes in the influenza virus – such a capacity was unavailable after the First World War, when an estimated 20 million people died of influenza worldwide."[45]

CONCLUSION

Epidemic disease has long been a source of national and international concern and as this comparison of the responses to the influenza pandemic of 1918-19 and the SARS outbreak in 2003 has demonstrated, health issues have moved from the periphery to the centre of global interaction. Although western nations had organised international agencies to protect their citizens from imported diseases, the worldwide tragedy of fear, flight, desperation and dedicated service that occurred ninety years ago revealed the limitations of national efforts to stem the tide of disease. But the new League of Nations Health Organization was unable to overcome nation states' resistance to establishing the type of international expert committees and international standards which its successor, the World Health Organization, has been able to create. Too much hatred after four years of war prevented including Germany and its revered scientific community from participating in the influenza research project while the American retreat to isolationism doomed the unification of *OIHP* with LHNO and prevented the creation of a body charged with both setting standards for international public health and controlling outbreaks of communicable diseases.

After British and American researchers identified Influenza A and B and learned how to prepare vaccines, the World Health Organization was on a firm scientific footing when it created its advisory and expert influenza committees, world influenza centres and regional laboratory system. But international politics, most notably the Cold War and mainland China's exclusion from the United Nations, meant that notification of impending outbreaks was not only delayed but also impeded by the limitations of the International Health Regulations which required each nation to notify WHO through official channels when disease appeared. The collapse of the Soviet Union appeared to offer an opportunity to rethink global public health especially as the health status of Russians, and other Eastern Europeans declined markedly in tandem with the spread of HIV/AIDS

45 Kelley Lee, "Globalisation: what is it and how does it affect health?" Medical Journal of Australia 180, No. 4(2004): 157.

in Africa, and the appearance of avian flu in Hong Kong in 1997. Gro Harlem Bruntland's appointment as the Director-General of WHO in 1998 inaugurated a new and more positive role for the organisation as she built on the surveillance methods provided by GPHIN and the expertise provided by GOARN team members.

When SARS appeared in 2003, the main challenge was to obtain information from each of the stricken nations and to ensure that the global response teams worked effectively with local and regional health officials to contain the outbreak. But beyond this fundamental task lay the challenge of calming fears and maintaining the economies of both stricken and unaffected nations. With CNN, the Internet and all other forms of media focused on the war in Iraq and SARS, the spring of 2003 was a dramatic moment. To its credit, both the main office in Geneva and the Western Pacific Regional Office in Manila provided daily press briefings and kept their web sites updated with the most recent information on the signs and symptoms of the disease, the number of probable and suspected cases and the actions being taken by various governments to ensure the safety of air travelers. Their model was copied by health ministries and those on the front lines of the outbreak and clearly demonstrated the importance of clear communication.

But in spite of this open sharing of information, fear and desperation affected the ill, their families, health care workers and various governments. Isolation and quarantine were psychologically stressful for patients in hospitals and their caregivers but even more difficult was the stigmatisation which individuals experienced. As in times past, those who were ill and their caregivers were shunned both during and after the illness.[46] The community effort which had supported so many during the 1918-19 influenza was not particularly evident in 2003. Nevertheless, SARS did bring great heroism to the fore as hospital-based health care personnel risked their lives to care for the sick. Many public health staff also worked diligently to ensure that contact tracing, quarantine supervision, case reporting and sample analysis occurred in a timely manner while their colleagues staffed phone lines and prepared educational material to provide the healthy with information about this unknown disease.[47] Ultimately it was 19th century public health

46 Arthur Kleinman and Sing Lee, "SARS and the Problem of Social Stigma," in SARS in China, 175-195.

47 Dena Hsin-Chen Hsin and Darryl R.J. Macer, "Heroes of SARS: professional roles and ethics of health care workers," Journal of Infection 49 (2004):210-215.

measures not 20th century scientific knowledge which controlled the outbreak – a fact which should remind us of the importance of knowing public health history.

Since communicable disease does not respect national boundaries, the new International Health Regulations build on our understanding of SARS and other communicable diseases by authorising WHO to announce disease outbreaks and to ensure that countries facing them provide the response necessary to contain them. This is a significant step forward but one which will require constant vigilance and recognition that global health requires all nations to support international health initiatives by sharing their scientific knowledge, ensuring that all who need them have access to vaccines and therapies, and that every effort to overcome fear and stigma are made.

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