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# The Social and Political Context of Disease Outbreaks: The Case of SARS in Toronto

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Dans cette étude, nous avons utilisé un cadre théorique relevant de l'écologie politique afin de construire un modèle critique et systémique pour expliquer comment il est possible de gérer une maladie infectieuse émergente, comme le SRAS, dans notre univers mondialisé. Nous espérons qu'un tel modèle contribuera à la mise en place de politiques de gestion des risques plus réalistes. Nous commençons par établir et analyser les interactions qui, dans l'environnement social et humain, ont facilité l'apparition de l'épidémie de SRAS dans un contexte local, celui de Toronto. Ensuite, nous montrons que cette épidémie a mis en lumière les insuffisances profondément ancrées du système actuel de gestion mondiale de la santé. Nous mettons l'accent sur le fait que, en cette ère de mondialisation, il est imprudent de trop concentrer efforts sur le plan local. L'analyse des épidémies doit plutôt se faire dans une perspective mondiale, et doit tenir compte du fait que les liens entre les pays développés et les pays en développement relèvent de l'écologie politique.

We adopt a political ecology framework to delineate a critical and systemic model that explains how an emerging infectious disease (EID), such as SARS, is dealt with in our globalized world. It is our hope that such a model will contribute to the development of more realistic risk-management policies. First, we focus on identifying and analyzing particular social and human-environment interactions that facilitated the spread of SARS within a local Toronto context. Second, we describe how the SARS outbreak brought to light the deeply rooted inadequacies involved in the current system of global health governance. We stress that in our globalized world it is unwise to focus too narrowly on the local context. The analysis of disease outbreaks must adopt a global perspective that considers the political ecological nature of the relationships between the developed and developing world.

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## INTRODUCTION

The purpose of this paper is to critically examine how social and political factors influenced the interaction between humans and the Severe Acute Respiratory Syndrome Coronavirus (SARS-S-CoV), the virus that caused the 2002 and 2003 outbreaks

in Toronto. We adopt a political ecology framework to delineate a holistic, critical, and systemic model that explains how an emerging infectious disease (EID), such as SARS, is dealt with and spreads in our "globalized" world.<sup>1</sup> It is our hope that such a model will contribute to the development of sound, more realistic risk-management policies. We address

two main questions: What impact did the Canadian government policies and politics have on the diffusion of the S-CoV, including its transmission? And, How was the local Toronto context of this disease linked to issues of global health governance?<sup>2</sup>

We focus on identifying and analyzing the social and human-environment interactions that facilitated the spread of SARS within the local Toronto context. The following factors are considered: (i) the impacts of Canadian fiscal policies and intergovernmental relationships on the Toronto public health system and on the Toronto acute-care system; (ii) the role of the public health and acute-care systems in the viral traffic and transmission of the S-CoV; (iii) the role of “superspreaders” in an age of globalization; and, (iv) the characteristics of the contemporary Toronto hospital setting and the role of human error. As we shall see, the influence of these factors on the unfolding of the SARS outbreak was amplified by the political economic context of the health-care system of Ontario. Finally, we describe how the local Toronto context of SARS links to the broader issues of global health governance. In all, we argue that the SARS outbreak brought to light the deeply rooted inadequacies associated with the current system of global health governance.

#### EMERGING INFECTIOUS DISEASES AND VIRAL TRAFFIC

EIDs are commonly defined as either diseases that have newly appeared in a population or diseases that have existed in the past, but are rapidly increasing in incidence or geographic range (Morse 1999). Most emerging infections appear to be caused by pathogens already present in the environment. Sometimes, the pathogens are provided with an opportunity to transfer from animals to humans or disseminate from an isolated group into new host populations — a process referred to as *viral traffic* (Morse 1993). Two sets of factors influence viral

traffic: (i) human-induced factors, including agriculture and economic development, global warming, failures of public health systems, laboratory techniques, etc. and (ii) changes in the genetic make up of pathogens themselves; although notably, human actions may also play a large role in enhancing pathogenicity or the increasing resistance of pathogens to antimicrobial agents (Farmer 1996; Morse 1996). As such, in analyzing how EIDs emerge and spread, a broader framework is required in order to analyze the human-environment relationship systematically (Ali 2004) and for this reason we turn toward a political ecology framework.

#### POLITICAL ECOLOGY OF DISEASE

One of the most well-established frameworks for studying disease in the context of human-environment interaction is that of *disease ecology*. It attempts to explain how humanity, including culture, society, and behaviour; the physical world, including topography, climate, and vegetation; and biology, including vector and pathogen ecology behave in an interactive system to produce a focal point for disease (May 1954). Although this framework has an expanded focus, both Mayer (1996) and Turshen (1977) note that political and economic influences on disease are not explicitly mentioned in the definition of disease ecology; discussions of power have been only “sporadically applied to understanding disease distribution” by disease ecologists (Mayer 1996). We agree that an analysis of political and economic factors must be an integral part of policy analysis at local and global scales. As such, we concur with Mayer who calls for a more explicit integration of a broadly defined political economy with disease ecology, forming what is referred to as *political ecology* of disease.<sup>3</sup>

In simple terms, political ecology emphasizes the influence of politics on human-environment interaction at a very local scale. Moreover, Mayer (ibid.)

cautions that given the interconnectivity of our modern world, this local scale must be linked to national and global scales to develop a comprehensive understanding of the disease in question. A classic example of how political interests are incorporated into disease ecology is the work of Fanaroff (1968) on Malaria in Trinidad. As Trinidad underwent a transition from an industrialized society to a cash economy, farmers, as well as other labourers, were faced with the urgent need for gainful employment. However, since the wages paid did not meet their economic needs, they continued to cultivate crops on their lands. The labourers could work in their fields only at dusk or dawn — specifically, those periods when the *Anopheles* mosquitoes were most likely to take blood meals. In this way malarial transmission was facilitated, thus leading to a notable increase in disease incidence. From this example, we can see that a combination of political action, economic circumstances, human behaviour, and the environment contributed to the onset of a public health problem involving an infectious disease. The case also demonstrates how a political ecological orientation can serve as a powerful tool for the systemic understanding of health and disease. Accordingly, it is within this political ecology context that our framework will help broaden our understanding of the SARS outbreak in Toronto.

#### DATA COLLECTION

We draw upon two commissioned investigative reports of the Toronto SARS outbreak: the report of the Ontario Expert Panel on SARS and Infectious Disease Control (Walker 2004) and that from the National Advisory Committee on SARS and Public Health (NACSPH 2003). Data were also collected from local and international newspapers and journal articles, conference proceedings, conference panel discussions held in Toronto, epidemiological reports, and interview data from several public health officials involved with the SARS outbreaks,

together these serve as the empirical basis for the political ecology analysis developed herein.

#### OVERVIEW OF THE SARS OUTBREAKS

In November 2002, the first SARS cases appeared sporadically at various locations in Guangdong, China. With international efforts, the viral agent was identified several months later as a novel Coronavirus (S-CoV). Although the reservoir is yet to be conclusively identified, the S-CoV has been isolated from wild animals such as Himalayan palm civets and raccoon dogs that are captured from the wild and sold for human consumption in crowded and somewhat unsanitary markets found throughout southern China (Wang and Jolly 2004; Peiris *et al.* 2003; Guan *et al.* 2003; Martina, Haagmans and Kuiken 2003). It is suspected that it was from such markets that a zoonotic transmission (transfer of an animal disease to humans) of the S-CoV was likely to have occurred (Wang and Jolly 2004; Zheng *et al.* 2004).

In February 2003, an elderly physician who treated patients with what was then only known as “atypical pneumonia” in southern China travelled to Hong Kong where 11 hotel guests became infected, including an elderly woman from Toronto. Those infected subsequently travelled to different parts of the world spreading the disease globally (CDC 2003a). The Canadian index patient returned from Hong Kong on 23 February 2003, and later died at home while her son (the primary case) died shortly after. Of the two patients in beds adjacent to the primary case, one spread the disease to 20 others while the other patient infected 19 individuals (Low 2004). After this initial outbreak in late February, a second outbreak phase began in mid-May. Notably, this occurred after the relaxation of containment measures such as halting patient transfers between hospitals, creating SARS units within hospitals, restricting visitor access, and implementing health

precautions at hospital entry points (including a body temperature check, mandatory hand-washing, and a health questionnaire, etc.) (ibid.).

The Toronto SARS outbreaks were largely contained to the health-care setting. In this context, health-care workers (including, but not limited to, doctors, nurses, housekeeping staff, ambulance personnel) became facilitators of viral diffusion; a situation that was intensified by the role of what has been referred to as *superspreaders* (CDC 2003b) — individuals who, unexplainably, exhibit enhanced infectivity. It is postulated that superspreaders may have higher S-CoV levels or produce more respiratory secretions.

The non-recognition of SARS cases during the early stages of the outbreak had several implications which significantly increased the environmental contamination. For example, Chen *et al.* (2004) observe that non-recognition was one of the most important factors that led to intra-hospital spread of cases among health-care workers. Medical procedures, such as intubation and those involving ventilators which were inadvertently placed in high-risk areas, put health-care workers at greater risk of exposure to respiratory secretions. Such workers were also more vulnerable to infection during this period because the need for increased attention to protective measures such as washing hands and wearing of gowns, gloves, N95 masks, and eye protection was not yet known. In this context, a study of 43 nurses working with Toronto SARS patients found that the probability of infection was as high as 6 percent per shift (Loeb *et al.* 2004).

Physical aspects of the hospital setting also created greater possibilities for environmental contamination. Following the spread of SARS in the Amoy Gardens apartment complex in Hong Kong, it was suspected that hundreds were infected due to a defective sewer system. It was at this point that it was hypothesized that environmental contamination was a possibility for SARS transmission. In support

of this hypothesis, a study based on the sampling of contaminated surfaces in the hospital environment found that SARS could be acquired through environmental contamination (Chen *et al.* 2004). Cleaning patients and the bedding after fecal incontinence was performed by health-care workers who were often less trained in infection control procedures; consequently, cleaning proved to be a high-risk duty and thus helped explain disease spread amongst hospitals in Toronto.

Thus far, the local context of Toronto SARS outbreaks has been examined. In the next section, we situate the Toronto SARS outbreaks within the broader political and social context of health policy in Canada. Furthermore, we examine how the disease spread and explain how the response reviewed above can be understood from a political ecology perspective.

#### CANADIAN FISCAL POLICIES AND THE SARS VIRAL TRAFFIC IN TORONTO

Toronto Public Health (TPH) is the municipal government agency responsible for disease surveillance, case investigation and management, identification and quarantine of contacts, and risk assessment and reporting. The two foremost reports on SARS, the National Advisory Committee on SARS and Public Health (2003), and the Ontario Expert Panel on SARS (Walker 2003) both concluded that TPH was ill-prepared for dealing with the SARS outbreak. The following sections discuss how these inadequacies in TPH can be traced to political ecological factors; factors which in turn set the stage for increased viral traffic within Toronto.

Lack of surge capacity, inadequate capacity for epidemiological investigation, and weak information technology infrastructure all led to an initially weak surveillance response that subsequently increased the flow of viral traffic in Toronto. Two immediate reasons account for this.

First, the number of public health workers and expertise within the organization was found to be inadequate to deal with an outbreak situation effectively, since at the time of the outbreak Toronto Public Health had only 1,800 employees (Basrur, Yaffee and Henry 2004; NACSPH 2003). Further, as discussed by a Toronto public health professional during an interview, TPH staff must deal with a large variety of public health issues: tobacco control, sexual health, pesticide use, mental health, etc. Thus, their expertise is divided among different specialty areas. As a result, many working within the TPH organization did not necessarily have adequate specialty training in infectious disease control, particularly with respect to the process of contact tracing which is critical to responding to disease outbreak situations.<sup>4</sup> This lack of human resource capacity and training directly led to inadequate data generation, especially in the first few weeks of the outbreak, and severely constrained outbreak response, making it difficult to quickly identify SARS cases (NACSPH 2003).

Second, the infectious disease tracking and outbreak management computer software was proven to be outdated and ineffective. The information technology (IT) system in place since the 1980s was the antiquated Reportable Disease Information System. A previous attempt to attract funds to upgrade the IT system was unsuccessful due to lack of political funding. The arrival of the integrated Public Health Information System (iPHS) did eventually occur in early 2000, and a formal commitment was made to start implementing this system in 2003. The SARS outbreak forced an early iPHS start, but staff members were ill-prepared to use the system under conditions of considerable urgency. As such, while TPH staff members were preoccupied with the immediate effects of battling the outbreak, they simultaneously had to learn and adapt new software tools (D’Cunha 2004). By the end of 2005, all health units were expected to use the iPHS system (Government of Ontario 2004).

The inadequacies of the TPH outbreak response were directly influenced by the Ontario contempo-

rary political-economic climate. Many agree that TPH suffers from chronic under-funding (see, e.g., NACSPH 2003; Basrur, Yaffe and Henry 2004; Glouberman 2001). The Ontario government reduced funding for a range of public programs in the mid-1990s, claiming that the cuts were a necessary strategy to prevent a fiscal crisis (see Coburn 2001; Armstrong and Armstrong 1994; Glouberman 2001; Knight 1998; McBride 2001). Health care and public health were among such programs. However, it is unclear how much money is actually spent on public health in Canada. At a national level, it is estimated that in 2003, spending on public health and prevention was nearly 8 percent of total health expenditure in Canada, an amount well above the OECD average of 2.9 percent in the same year (OECD 2005). But as the Canadian Institute for Health Information notes, the estimates of public health spending are confounded by the inclusion of substantial administrative costs of provincial health ministries. Ontario budget data suggests that about 2.3 percent of the provincial health budget is spent on public health (CIHI 2003; Palmer 2003).

Related to the discussion of government’s fiscal policies is the notion that decisionmakers generally favour visible and measurable outcomes, such as length of stay in hospital or number of beds, over long-term preventive measures of public health (such as anti-smoking campaigns). This holds true in the case of SARS: the federal government was reluctant to provide emergency funding during the first few weeks of the outbreak on the grounds that SARS was not a “national disaster with a quantifiable ending” (Iverson 2003). As will now be discussed, the consequences of such decreases in the public financing of health care has had serious repercussions for the SARS outbreak response in Toronto.

The cuts to health care are directly related to the problems of inadequate surge capacity during the outbreak. For example, as numerous hospital wards were shut down to limit the spread of S-CoV, a

shortage of hospital beds arose as SARS units in Toronto hospitals became overloaded (NACSPH 2003). Furthermore, as greater and greater numbers of health-care specialists were exposed to the S-CoV during the early stages of the outbreak, they had to undergo quarantine, thus removing even more professionals from an already limited pool of skilled personnel. Consequently, those few remaining specialists were forced to work longer shifts. Nurses, for example, typically worked 12-hour shifts, which in turn increased the risk of exposure as overworked staff were more likely to make mistakes and overlook, or even ignore, preventive procedures due to fatigue (Varia *et al.* 2003).

The impact of cuts was perhaps most dramatically felt in the nursing sector. Under conditions of reduced funding, Ontario employers were not obliged to pay out benefits to part-time or “casual” workers. In this sense, the nursing labour force in Ontario is highly casual; as such, some nurses were forced to work in several hospitals to earn an adequate living (Perkel 2003; Nuttall-Smith 2003). As noted by the executive director of the Registered Nurses Association of Ontario, in 1998 only 48 percent of nurses had full-time employment (Grinspun 2005). Such circumstances increased the potential for inter-hospital spread of the S-CoV. Perhaps, due to the special directive that nurses work only at one site during the outbreak (Burcher 2003), only one case of inter-institutional transmission was documented (NACSPH 2003). However, such restrictions further constricted the available pool of nurses (Hall *et al.* 2003). It must be mentioned that in the post-SARS period, the provincial government in Ontario promised to raise the percentage of full-time nurses to 70 percent by 2007 (Ontario Minister of Health and Long-Term Care 2005). Results from a survey of Ontario registered nurses and health-care employers show that government efforts to increase full-time employment for Registered Nurses (RN) are starting to pay off, but the goal of having 70 percent of all RNs working full-time will clearly not be met without more targeted funding and better working conditions for nurses (RNAO 2005).

The high degree of disconnect between the public health system and the health-care system, particularly hospitals, was another factor contributing to increased viral traffic. Not only was there a disconnect between TPH and hospitals, but hospitals in the municipality were themselves disconnected from each other across the hospital network (Lim *et al.* 2004). For the most part, each hospital acted independently to contain and control SARS; this greatly increases the likelihood that flow patterns of the disease would remain unchecked (Affonso, Andrews and Jeffs 2004). In an attempt to bridge this communication gap, a Provincial Infectious Disease Advisory Committee (PIDA) was recently formed (Government of Ontario 2005). However, the effectiveness of this initiative remains to be determined.

In short, the SARS outbreak response dramatically revealed the severe inadequacies in the Ontario public health system and hospital sector in Ontario. However, another factor, the nature of intergovernmental relationships, also significantly contributed to the problems faced during the outbreak, particularly the need to rapidly mobilize resources — human, financial, and material — during an outbreak.

#### INTERGOVERNMENTAL RELATIONSHIPS IN CANADA AND THE SARS VIRAL TRAFFIC

In a recent conference in Toronto, Dr. David Heymann, the World Health Organization’s (WHO) chief infectious disease expert, noted that “SARS has shown us that the relationship between various orders of governments are very important in public health and very difficult to establish. This certainly has been a problem in Canada” (Heymann 2004). The conflict between federal, provincial, and territorial governments over the division of jurisdictional responsibilities is a deeply entrenched problem that deserves an extensive discussion of its own. Briefly though, both unclear constitutional responsibilities for provision of health services, as well as a long

history of federal and provincial conflicts about how much money each order of government must spend on health services, have contributed to ineffective intergovernmental relationships in health-care provision and maintenance within the Canadian context (Deber 2000).

The unclear division of responsibilities clearly impeded the SARS response in Toronto. For example, the question of funding to deal with the SARS outbreak was a significant problem as local health units had difficulty accessing funds from municipal governments (D’Cunha 2004), while the federal government was reluctant to provide emergency funding as alluded to earlier. Problems stemming from the lack of jurisdictional responsibilities also arose in relation to data ownership among different levels of governments during the outbreak. In this light, the Dean of Medicine at the University of Toronto pointed out that “while Hong Kong filled the medical journals with first-class studies, all the while managing a much bigger outbreak ... we were arguing over who owned the data” (Palmer 2003).

In order to encourage cooperation between different government levels, the National Advisory Committee on SARS and Public Health proposed the formation of a Canadian Agency for Public Health, which would foster collaboration between governments. Following upon this recommendation, the Public Health Agency of Canada (PHAC) was formed as part of the public service, headed by Dr. David Butler-Jones, Canada’s first chief public health officer. PHAC reports to the minister of Health and is expected to work closely with Health Canada. The agency describes one of its main roles as the following: “The Agency and the Chief Public Health Officer will provide a clear focal point for federal leadership and accountability in managing public health emergencies” (PHAC 2005). Notably, the Centre for Infectious Disease Prevention and Control is one component making up the PHAC. Presently, perspectives on the value of this new agency are divided: some argue it is a step in the

right direction, while others argue that collaborative agencies, in general, are problematic because they obscure accountability (Wilson 2004). We contend that, although some shortcomings are inevitable, the agency offers many advantages in terms of the potential to minimize conflict by considering the interests of all government levels more explicitly, thus ensuring jurisdictional sovereignty remains intact. As Wilson (*ibid.*) points out, if this collaborative approach proves to be unsuccessful, then a more hierarchical approach may be adopted in order to reduce bickering over data ownership and confidentiality matters. Thus far, we have examined the impact of Ontario economic policies and intergovernmental relationships on certain aspects of the Toronto SARS response. As we discuss below, other aspects of the SARS response were influenced by the contemporary global political context.

#### GLOBALIZATION, SARS AND GOVERNANCE OF DISEASE

In an interconnected world, containment of epidemics depends on transnational cooperation. Within our increasingly globalized world, microbes travel faster than ever via the massive number of people, commercial shipments, food and other items that cross national borders every second via planes, trains, or ships. Garrett (1994) contrasts the spread of the Spanish flu in the days of steamships and isolationism with disease spread in the present age of international economics and jet travel. As such, the action or inaction of a sovereign state regarding the management of EIDs can jeopardize the health of other nations. States can have their individual rules and regulatory mechanisms for governing health and disease at the local level, but it is no longer possible to ignore health risks that happen beyond our boundaries. This is referred to by Farmer (1996) as “the increasing permeability of geopolitical boundaries,” and by Aginam (2004) as “mutual vulnerability of Westphalian nation states to microbial threats.”<sup>5</sup> Given the new realities of our modern world, a fresh



political mindset is necessary to manage EIDs effectively. This new political mindset acknowledges that states must pool resources, share responsibility and, perhaps, even compromise some degree of sovereignty to achieve a collective protection against global health threats. In this connection, two important related questions arise: (i) Does the aforementioned mindset truly exist? and (ii) Does an appropriate system of global health governance exist through which this mindset can materialize? A short answer to both posed questions is: not at the moment. As will be discussed shortly, the SARS outbreak emphasized both the importance of such perspective and the need for an effective global health governance system.

The aforementioned mindset does not truly exist at the global political level. Pooling resources for strengthening health systems of developing nations, for example, is long overdue. Many infectious diseases are still thought of as diseases limited to the developing world, diseases with which the developed world is not concerned. Consider that HIV/AIDS — currently one of the most serious microbial threats — merited only a laughable two lines' mention in the lengthy New Economic Plan for African Development (Nolen 2003). In contrast to the AIDS epidemic, the SARS outbreak received much more publicity and attention: What made SARS different from AIDS? The difference is simple. SARS brought the "mutual vulnerability" issue into the spotlight because it hit the vulnerable centres of global commerce. Kickbusch (2003) notes that: "With SARS — as in the days of quarantine and the great cholera epidemics — it is the harsh impact on trade and commerce (tourism, banking, the airline industries, the restaurant and service industries, educational institutions, and the like) that could become the driving force for change." In Canada, the economic cost of SARS was estimated at \$30 million daily. It is projected that China and South Korea suffered from \$2 billion in SARS-related tourism and economic losses (Aginam 2004). Due to these circumstances, SARS was perceived as an

"everyone disease" and not just a "disease of the poor," or "the other." And, as such the SARS's message — that everyone is at risk and everyone needs protection — was more clearly heard.

#### INTERNATIONAL HEALTH REGULATIONS, 1969 AND 2005

SARS demonstrated that global health governance at the time of the outbreak was structurally very weak. It revealed that the only existing global regulations for the control of infectious diseases, the international health regulations (IHR), were not responsive enough to the types of health risks the world now faces. In place since 1969, the purpose of the IHR 1969 was to ensure maximum security against the international spread of diseases coupled with an emphasis on minimal interference with international trade. The SARS outbreak introduced critical questions about IHR 1969, two of which will be discussed here.

First, under the IHR 1969, only cholera, plague, and yellow fever were classified as notifiable diseases, meaning that states were required to notify the WHO only when these particular diseases occurred in their respective nations (WHO 2002, 2003a, 2005a). The emergence of a novel disease, such as SARS, demonstrates that the focus on only three diseases is inadequate. Barrett *et al.* (1998) notes that the CDC has compiled a list of 29 new emerging diseases since 1973. Some of these new diseases greatly contribute to adult mortality and morbidity. HIV/AIDS is a dramatic example of a disease with global dimensions excluded from the IHR 1969.

The limitations of reporting on only three diseases required by IHR 1969 were already well known before the SARS outbreak, nonetheless, the revision process was slow. In the early 1990s, the resurgence of some well-known epidemics, such as cholera in parts of South America, and the emergence of new

infectious agents, such as Ebola haemorrhagic fever, resulted in a call for the revision of IHR 1969 in 1995 (WHO 2005a). Surprisingly, it was not until May 2005 that, following a series of reviews and recommendations, the World Health Assembly finally adopted the new IHR 2005 (discussed below). Evidently, the SARS outbreak in 2003 was, indeed, a catalyst in this process.

Second, the SARS outbreak further provoked discussions regarding WHO's powers and capacities to deal with such emergencies. For example, after the WHO issued a travel advisory against SARS-affected areas, including Toronto, it was accused of exceeding its remit by Health Canada, and other such agencies, which would have preferred to portray SARS as a containable local problem (Ali and Keil 2006). The question being asked was: What is the correct balance between state sovereignty and protection of the global community? While the WHO is responsible for taking action to prevent the international spread of disease, its actions must be respectful of national sovereignty and should take into account the potentially negative impact they may have on individual countries (Wilson and Singer 2006). This is particularly true in countries where tourism is essential to the national economy. These concerns have been addressed in the revised IHR 2005, which formalized the process by which the WHO can introduce such measures (WHO 2005d).

The core purpose of IHR 2005 is the same as IHR 1969: to ensure maximum security against the international spread of diseases with a minimum interference in world traffic and trade. However, the new IHR 2005 differs from IHR 1969 in a few significant ways. The IHR 2005 requires states to notify the WHO of all events that: constitute a public health risk to other states through the international spread of disease, and, potentially require a coordinated international response (WHO 2005a). This broadens the scope of the IHR 1969 to cover existing, new, and re-emerging diseases, including emergencies caused by non-infectious disease agents. In

addition, the WHO requires that the countries' response must be adequate to contain the threat. The IHR 2005 sets out the basic public health capacities a state must develop, strengthen, and retain at the primary, intermediate, and national levels in order to detect, report, and respond to public health risks and potential public health emergencies of international concern. Furthermore, the WHO is expected to assist nations, if they so request, in building, strengthening, and maintaining public health capacities required under these new regulations (see WHO 2005a, b, c). The regulations explicitly outline the WHO's power to deal with such emergencies in varying capacities: the power to issue recommendations in an outbreak classified as a "public health emergency of international concern"; the power to share information with other state parties if an affected state "does not accept the offer of collaboration"; the legitimacy to gather information from "all available scientific evidence and other relevant information" (Wilson, McDougall and Upshur 2006) and significantly, the process through which the WHO can introduce travel advisories has become formalized (Wilson and Singer 2006; for details see WHO 2005d).

Even though it is true that IHR 2005 is both necessary and long overdue, it is important to consider how practical and realistic the implementation of these proposals will be. Gostin (2004) correctly points out that the global community has long failed to answer the call for generous investment in the public health of low-income nations — those that urgently require such funds to combat and contain disease threats. It is unclear as to who will pay for strengthening the weak, sometimes non-existent public health infrastructure of low middle-income countries. It is highly questionable that the WHO could provide much monetary support given that the "regular" budget of the WHO is only US \$800 million a year: an amount less than it takes to run an average hospital in the US (Kickbusch 2003).<sup>6</sup> Furthermore, some countries do not comply with travel and trade restrictions that are damaging to

their economy, and as result, disease outbreaks are not reported in a timely manner. As mentioned earlier this is particularly true in countries where tourism is essential to the national economy. Kickbusch (*ibid.*) recommends that policymakers revisit, within the WHO, the principles and the application of international trade law in view of disease threats so that countries are not penalized for the wrong reasons or subjected to excessive measures from other states. In short, mechanisms to protect developing countries from the economic burden associated with an outbreak must also be present alongside a revised IHR in order to ensure that such a nation's sovereignty is not threatened, as was the case with the legacy of "tied aid" and structural adjustment programs. As such, it is arguable whether the revised IHR will lead to the necessary changes needed to combat disease threats of the future both systematically and equitably.

## CONCLUSION

Our analysis has suggested that the contemporary Canadian fiscal policies, for the most part, have had adverse impacts on EID management. Cutbacks to the Toronto Public Health and the acute-care sector have resulted in a lack of human resources and an inadequate public health infrastructure that were required to manage the SARS outbreak. The casual nature of the nursing profession increased the chances of inter-institutional transmission of S-CoV as well as producing anxiety and frustration for many health-care workers. Furthermore, the existing conflict between different levels of government in Canada clearly exacerbated problems in the response to SARS in Toronto. This chronic conflict between levels of government led to confusion over data ownership and division of responsibilities, both of which had adverse impacts on the management of SARS. In light of the SARS outbreak, since June 2004 the Ontario government has engaged in Operation Health Protection: a three-year plan to make comprehensive changes to public health since the 1980s (Government of Ontario 2005). Also, we have

observed some positive changes: for example, the creation of the Public Health Agency of Canada. However, the question remains: Is this shift in perspective sustainable over the long run? It appears that when public health is effective, such effectiveness goes unnoticed and, therefore, unacknowledged.

We stress that in our globalized world, as the SARS outbreak has shown, it is unwise to focus too narrowly on the local context. In this light, the last section of the paper situated the Toronto SARS outbreak within the broader global context by considering how the analysis and response of the viral traffic associated with disease outbreaks must adopt a global perspective that considers the political ecological nature of the relationships between the developed and developing world. As the world faces a new surge in EIDs, most notably the possibility of a pandemic of avian flu, it is crucial that disease outbreak response and containment not be considered simply a localized technical or medical phenomenon, but a phenomenon in which the political ecological context is integral.

## NOTES

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<sup>1</sup>The term "globalization" is highly contested, resulting in various definitions. We adopt Lee's definition (Bettcher and Lee 2002): a process contributing to intensified human interaction in a wide range of spheres (economic, political, social, and environmental) and across three types of boundaries — spatial, temporal, and cognitive — that separate individuals and societies. Lee *et al.* (2002) explains these boundaries in the following way. First, globalization is changing how we perceive physical space. On the one hand, factors such as information technology, global economy, and air travel make us think of the world as a single place where we are brought together by interrelatedness of our environments (*i.e.*, the "global village"). On the other hand, globalization has further intensified the divisions between societies

of the north and the south. Globalization has also created new forms of space such as cyberspace which opens new possibilities for social relationships. Second, globalization increases and expands not only ways we travel but also ways we communicate. Third, more than ever, new global information and communication systems influence how we think — through education systems, advertising, research institutions, public relation companies, etc.

<sup>2</sup>Opinions vary amongst scholars as to what global health governance (GHG) means conceptually (see, e.g., Murphy 2003; Bettcher and Lee 2002; and Fidler 2004b). In the context of our discussion, a simple definition of GHG refers to how societies, within and beyond national borders, structure responses to the public health challenges they face.

<sup>3</sup>In a broad sense, political economy is concerned with how and why a society produces and distributes societal resources among its population in a certain way (Howlett and Ramesh 1992).

<sup>4</sup>Based on personal histories and follow-up calls, contact tracing involves the identification and location of persons who may have been exposed to a person with SARS-CoV infection. Once identified, possible cases are regularly monitored while probable and actual cases will undergo strict or modified quarantine (CDC 2005c).

<sup>5</sup>The key principle of the Westphalian structure is sovereignty. The state inserts absolute control over its territory and people. In this system, it is not acceptable for one state to intervene in the domestic affairs of other states (see Fidler 2003).

<sup>6</sup>The regular budget refers to the obligatory annual contributions levied from the member states, and it finances the ordinary program of the organization. This budget is different from the extra-budgetary resources that come mostly from rich member states and are usually earmarked for specific programs based on priorities of those nations (see Minelli 2004).

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