Engaging avian influenza: the uncertainties and pragmatics of pandemic preparedness in Hong Kong-SAR

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Abstract

This thesis investigates the avian influenza pandemic preparedness project in Hong Kong Special Administrative Region (SAR). I explore how the state, through its policies, practices, and actors, engages with the uncertainty posed by a future avian influenza pandemic by forming preparedness protocols that seek to mitigate portended misfortunes in pragmatic ways. I contextualize current preparedness practices into a history of infectious disease management in Hong Kong. Media reports and interviews elucidate nuances between state discourse on avian influenza and state healthcare actors' personal perceptions and practices. I argue that an engagement with the uncertain is fundamental to the very existence of avian influenza as a powerfully real social entity. While fissures and points of contradiction are evident, the logic underpinning pandemic preparedness remains intact, allowing for the continued existence of avian influenza despite its prolonged low incidence of human infection and continued uncertainty.

Résumé

Ce mémoire porte sur le plan d'action en prévision d'une pandémie de grippe aviaire dans la région administrative spéciale de Hong Kong. J'examine les engagements de l'état face à l'incertitude d'une eventuelle pandémie de grippe aviaire à travers les politiques, les pratiques et les acteurs qui contribuent à des mesures pragmatiques pour mitiger des malheurs potentiels. Ces mesures sont considerées dans le contexte historique de la gestion des maladies infectieuses à Hong Kong. Des entrevues servent à démontrer les nuances entre le discours étatique sur la grippe aviaire et les perceptions et les pratiques individuelles du personnel de santé de l'état. Un engagement avec l'incertitude est au coeur de l'existence de la grippe aviaire comme une entité sociale puissante. Malgré des ruptures et des contradictions, la logique sous-jacente des mésures et des plans contre la pandémie demeure intacte, et elle assure la perénnité de la grippe aviaire malgré son faible incidence d'infection chez les humains et les incertitudes qui l'entoure

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Introduction

In 1996, a novel highly pathogenic strain of influenza was identified: avian influenza A (H5N1). Since the first human cases in 1997, H5N1's high mortality rate, ubiquity in avian carriers the world over, and demonstrated ability to transmit directly from birds to humans appears to herald the advent of the next influenza pandemic. Global, national, and local institutions have responded by establishing pandemic preparedness plans that seek to delay further disease incidence and set up protocols for dealing with future outbreaks. Preparedness plans are presented as urgent and necessary measures that require global partnerships and local compliance. Despite the pandemic potential ascribed to H5N1, human diagnosed cases remain low. In this light, an underlying paradox within preparedness efforts surfaces: avian influenza is constituted as being everywhere yet in actuality is (almost) nowhere at all.

My thesis investigates the avian influenza pandemic preparedness project in Hong Kong Special Administrative Region (SAR), a post-colonial territory situated at the hazardous intersection between the movement of people and goods spurred on by global commerce, late-socialist Chinese sovereignty, and an emerging infectious disease of portended pandemic proportions. I explore how the state, through its policies, practices, and actors, engages with uncertainty by forming preparedness protocols that seek to mitigate future misfortunes in pragmatic ways (Reynolds-Whyte 1997; Evans-Pritchard 1937). I argue that an engagement with risk not only allows for the avian influenza paradox to be explained away within the pandemic preparedness project, but is fundamental to the very existence of avian influenza as a powerfully real social entity. While fissures and points of contradictions are evident, the logic underpinning pandemic preparedness remains intact, allowing for the continued existence of avian influenza despite its prolonged absence in humans and continued uncertainty.

Ascribing Pandemic Potential

Avian influenza A (H5N1) was first identified in 1996 on a goose farm in Guangzhou, the capitol of the People's Republic of China's (PRC) Guangdong Province.^{1,2} In May 1997, a 3-year-old male resident of Hong Kong died of acute respiratory distress, later identified to be caused by H5N1 (Katz et al. 1999). Seventeen other cases of H5N1 occurred in Hong Kong in November and December of that year, leading to another five fatalities. Acting in consultation with the World Health Organization (WHO) and the United States Center for Disease Control and Prevention (CDC), the Hong Kong Department of Health implemented a series of stringent measures of outbreak control (Hong Kong 1998): surveillance and laboratory networks were strengthened, poultry markets were thoroughly sanitized, all poultry trade was stopped for seven weeks (Kung et al. 2007), and starting on December 29, 1997, 1.5 million chickens and several thousand other domestic fowl were culled in just four days (Bridges et al. 2000). No further cases of H5N1 were detected until 2001, when the virus reemerged in live poultry sold at a retail market in Hong Kong (Kung et al. 2007).

¹ To view the WHO official time line of major events in the development of H5N1, visit: <u>http://www.who.int/csr/disease/avian_influenza/Timeline_08_06_2.pdf</u> (accessed: June 4, 2008)

² A note on influenza virology and nomenclature. Influenza refers to a group of viruses that affects both mammals and birds. Influenza viruses are grouped into three types: 'A', 'B', and 'C'. While 'B' and 'C' viruses primarily infect humans, 'A' viruses infect a host of other animals, such as pigs, horses, sea mammals, and birds. While 'C' viruses are stable, 'A' and 'B' viruses are more prone to mutation. 'A' viruses are particularly prone to mutation as they lack a 'proof-reading mechanism' for genetic replication, making them primed for evolving into new strains and causes widespread disease. Influenza viruses are further classified by two extracellular protein extensions: hemaglutinin (HA) and neuraminidase (NA). There are fifteen HA subtypes, designated H1 through H15, and nine NA subtypes, designated N1 through N9. An individual strain of influenza virus is labeled according to its HA and NA proteins, rendering a HXNZ nomenclature, where X=1-15 and Z=1-9 (World Health Organization 2005).

Thereafter, several outbreaks were identified in poultry populations in Hong Kong and elsewhere (Kung et al. 2007). In 2003, human cases were again confirmed in Hong Kong and since then, the WHO has confirmed 383 human cases of H5N1 leading to 241 deaths in 15 countries around the world.³

Following the 2003 reemergence of H5N1 in humans and the concurrent SARS (Severe Acute Respiratory Syndrome) pandemic, the WHO, led by several key countries, developed preparedness plans that sought to prevent influenza pandemics and establish systems to more efficiently deal with outbreaks as they occurred. The resulting 2005 WHO report, Avian Influenza: Accessing the Pandemic Threat, opens with a statement by the then WHO Director-General Dr. Lee Jong-wook: "The H5N1 virus has given us not only a clear warning but time to enhance preparedness" (World Health Organization 2005, 3). The ability to read certain events as warnings that required preparedness was primarily gained through a reading of the history of past influenza pandemics and scientific research available at the time. The three influenza pandemics of the twentieth century, occurring in 1918-1919 (Spanish Flu), 1957-1958 (Asian Flu), and 1968-1969 (Hong Kong Flu), caused an estimated 43 million deaths and affected more than one quarter of the total world population (Ibid, 23). Preparedness plans intend to prevent pandemic influenza from causing the same level of mortality, morbidity, and broader societal damages. Previous to the Hong Kong 1997 outbreak, avian influenza A viruses were not associated with respiratory disease in humans (Bridges et al. 2000, Katz et al. 1999), despite documented human contact with infectious strains (Bean et al. 1985). Further, only the H1, H2, and H3 hemaglutinin subtypes had been known to cause

³ <u>http://www.who.int/csr/disease/avian_influenza/country/cases_table_2008_05_28/en/index.html;</u> (accessed: May 28, 2008).

outbreaks in humans. The novelty of H5N1 in humans meant a lack of pre-existing antibodies, raising concerns of its pandemic potential (Bridges et al. 2000). While studies have found that the main risk factor to be contact with poultry, H5N1's true pandemic potential stems from the possibility that the virus would either reassort with human influenza strains or mutate and become more transmissible among humans (Mount et al. 1999).

Hong Kong has been cited as being particularly vulnerable of being the epicenter of an H5N1 pandemic for several reasons. First, although human cases have not been confirmed since 2003, Hong Kong is where H5N1 was first identified in humans and has repeatedly confirmed cases in avian carriers, the latest being in early June 2008.⁴ Second, avian, swine, and human population densities in the neighboring areas are high and overlap, promoting the transfer of influenza viruses between birds and humans via swine reservoirs (World Health Organization, 2005). This condition has historically made southern China a major site of influenza pandemic outbreaks, dating back to the first recorded influenza pandemic in 1580 (Ibid, 25). Third, the continued practice of purchasing live poultry at markets poses a threat of increasing the spread of H5N1 to uninfected farms and humans who frequent live poultry markets (Liu 2008, Kung et al. 2007). Fourth, Hong Kong is positioned along wild bird migration routes, so that infected wild birds may infect local avian populations (Causey and Edwards 2008, Chen et al. 2005). Finally, Hong Kong is susceptible to the importation of H5N1 from travelers arriving from potentially infected regions. As a global economic center, the rapid movement of people into and out of the territory could spread infection globally, sparking a pandemic (SARS Expert Committee 2003).

⁴ <u>http://www.info.gov.hk/gia/general/200806/11/P200806110373.htm</u> (accessed: June 14, 2008)

Engaging the Uncertain: A Window for Understanding Preparedness Efforts More than ten years after the initial outbreak in Hong Kong, H5N1's pandemic potential remains uncertain. Given the lack of human cases of H5N1, how do the state and health authorities understand the uncertainty posed by avian influenza and connect this understanding to a need for pandemic preparedness? Put in another way, how is avian influenza made into a real object that the state can act upon in despite of low incidence in humans?

Most broadly, I situate this guiding investigative question into anthropological studies on concepts of mitigating misfortune in order to analyze preparedness efforts as a method for engaging with the uncertainty associated with H5N1 and establishing a system to cope with portended ramifications. In medical anthropology, this line of inquiry derives from E.E. Evans-Pritchard's classic ethnography *Witchcraft, Oracles, and Magic among the Azande* (1937). For the Azande, witchcraft served as a powerful explanatory model for understanding unfortunate events, from why one had stubbed their toe on a frequently traveled path to why a person had died, and moreover, an archetype for reacting to such events. Although Evans-Pritchard acknowledged that witches, as the Azande conceived them, could not exist, he emphasized that witches were made real for the Azande through practices that addressed issues of witchcraft, providing them with a sense of security within an uncertain environment.

Drawing from Evans-Pritchard, Susan Reynolds-Whyte (1997) concentrates on health-seeking practices among the modern-day Nyole of eastern Uganda. These practices seek to address issues of misfortune through the alleviation of suffering and the mitigation of uncertainty. Reynolds-Whyte argues that despite actors' active engagement with uncertainty, the experience of misfortune and the process of dealing with it are

continually mired in concerns with the uncertain (Ibid, 19). As uncertainty can never fully be bounded and ascertained, the process of securing certainty necessarily entails the existence of alternatives: choosing a response to a particular problem demands the rejection of other options that may have proven more efficacious (Ibid, 23). Thus, practices that seek to mitigate misfortune carry a dual sense of limiting uncertainty and also of opening new spaces of ambiguity and insecurity.

Recent works in medical anthropology have built upon the theme of engaging with uncertainty to investigate modern methods for understanding misfortune and assessing the uncertain. In her ethnography on the effects of the 1986 Chernobyl disaster, Adriana Petryna (2003) highlights Ukrainian citizens' resourceful manipulation of scientific categories in their search for entitlements during an era of post-socialist transition marked by uncertainty. Though their search is not always successful, Petryna stresses citizens' active engagement with unstable scientific categories and their negotiation of multiple dangers to alleviate individual and familial suffering. Margaret Lock's article on genetic testing for breast cancer (1998) and more recent articles on Alzheimer's testing (Lock et al. 2006, Lock 2005) parallel modern predictive technologies to the art of divination: both endeavor to reliably connect signs in the present to undesirable conditions in the future. Although modern technologies have provided more accurate predictions of who may be struck with misfortune, this does not signal the end of uncertainty but indicates the shifting possibilities of how people engage with it.

Common to all ethnographies of engaging with uncertainty is the uneasy boundary between the subjective and the objective, which often cannot be fully

understood by the ethnographer. As Allan Young (1995) has pointed out for his study on post-traumatic stress disorder (PTSD), the role of the ethnographer is not to deny the existence of a particular object of research but rather to explain how it is made real. For example, though Evans-Pritchard recognized the impossibility of witchcraft in reality, he asserted its existence for the Azande; Petryna demonstrates that although scientific understandings of the effects of radiation were constantly shifting, they were made real to Ukrainians navigating state systems of retribution. In the reviewed ethnographies, an explanation of how things are made real concentrates on the documentation of practice.

Epidemiological literature on avian influenza is based on scientific reasoning that fashions large-scale uncertainty into categories of risk. Due to the lack of human diagnosed cases and the diversity of determinants that could potentially contribute to an avian influenza pandemic, influenza risk assessment is a fundamentally "uncertain art" (Dowdle 2006). In epidemiology, risk is defined as any behavior or condition that affects the probability of disease. Risk represents a correlate, which provides a statistically derived relation that places an individual's particular behavior or condition into the broader context of the population. It is thus important that what constitutes a 'population' and the individual's relation to this "population" be thoroughly understood in order to obtain a meaningful comprehension of risk (Trostle 2005). Risk can be approximated but never exactly measured (Dunn and Janes 1986), leading to a sense of fallibility and indeterminism despite increasingly rigorous analyses (Trostle 2005; Hacking 1990). The risk of an avian influenza pandemic goes beyond mundane risk, and can be thought of what Slovic (1987) has termed "dread risk": risk that is "unknown, uncontrollable, inequitable, catastrophic, and likely to affect future generations" (Ibid, 285). Dread risk,

or pandemic potential, associated with avian influenza provides a powerful justification for creating and enacting preparedness measures.⁵

Risk is further problematized by the subjective and multifarious ways in which it is created, conveyed, and understood (Trostle 2005, Slovic 1987). In her investigation of the clinical encounters of breast cancer testing in the United States, Sandra Gifford (1986) traces out the differing ways that epidemiologists, clinicians, and patients interpret and live with categories of risk. More recent anthropological works have examined this point in terms of risk associated with Alzheimer's in North America (Lock et al. 2006, Lock 2005), Huntington's Disease in England (Konrad 2005), and amniocentesis in the United States (Rapp 1999). My thesis builds upon this body of anthropological work to examine the risk posed by avian influenza as a category of uncertainty that is being engaged not only by individual actors, but also the Hong Kong-SAR state. I investigate the practices that health researchers and officials use to produce knowledge that seeks to lessen the uncertainty posed by avian influenza, how state institutions then utilize this knowledge to mitigate misfortunes that a pandemic is predicted to cause, and in effect, how avian influenza is made real.

Infectious Disease Epidemics: Perspectives from the Social Sciences

Over twenty-five years ago, Allan Young (1982) outlined the tremendous developments that had established medical anthropology as a distinct field of research. Since then, several ethnographers have specifically addressed issues surrounding infectious diseases. Briggs and Mantini-Briggs' dissection of the 1992-1993 cholera epidemic in Venezuela contends that cholera is the "quintessential disease of modernity"

⁵ Dread risk associated with a future avian influenza outbreak has also been capitalized on by the media, such as award-winning author Mike Davis' book *Monster at Our Door: The Global Threat of Avian Flu* (2005) and the ABC made-for TV movie *Fatal Contact: Bird Flu in America* (2006).

(2003, 96), occurring as a result of global trade and governance and appearing most prominently along the social fault lines produced by the processes of modernity. Geissler (1999, 1998) examines how traditional and biomedical models of the body and worms are understood and used by the Luo of eastern Uganda. Mull's (1997) study of mothers of malnourished children in a squatter settlement outside Karachi, Pakistan focuses on the local perceptions that effect the treatment of measles. Using the development of *kuru* in Papua New Guinea and bovine encephalopathy (BSE) in the UK and Europe, Lindenbaum asserts that infectious disease epidemics follow a generalizable dramaturgic, and advocates for a more attentive ethnographic engagement during early phases of disease emergence.

The global spread of HIV/AIDS has stimulated much anthropological research in a variety of regional settings (Inhorn and Brown 1997). Paul Farmer (1992) traces the rise of HIV/AIDS in rural Haiti through a three-hundred year history of exploitation and marginalization. Steve Epstein (1996) documents the rise of AIDS activism in the United States and its role in challenging biomedical knowledge and government policies. Through his work on HIV/AIDS in Burkina Faso, Vihn-Kim Nguyen (2004) looks at how transnational humanitarian interventions have produced particular subjectivities, which he calls "therapeutic citizenship."

Most work on infectious diseases in China is concentrated in demography, public health, and behavioral medicine. Several historians of modern China have however researched infectious disease epidemics. Kerrie MacPherson (1998) has documented the conflicts that arose during the introduction of Western nosology to China during the nineteenth century cholera epidemics. Carol Benedict's (1996) work on the eighteenth

and nineteenth century bubonic plague epidemics provides both macro-level analysis of the spread of disease and a review of micro-level political and social dimensions of the epidemics. Through her case study of the 1894 plague outbreak in Canton and Hong Kong, Benedict reveals that although Western plague remedies were no more efficacious than classical Chinese therapies, Westerners still viewed outbreaks as indicative of the ineffectiveness of the Qing state and moreover of the habits and living conditions of the Chinese (Ibid, 140). Larissa Heinrich has gone further to argue that nineteenth century colonial encounters in southern China produced the idea of "Chinese culture as pathogen," so that Chinese identity was seen as the underlying cause and source of illnesses (Heinrich 1999, 253).

Recent works in medical anthropology have specifically addressed emerging infectious disease epidemics in China. Kleinman and Watson's edited volume on the 2003 SARS pandemic focuses on Asia, bringing together chapters that lend a multidisciplinary perspective that go towards the editors' goal of finding a new approach to understanding human epidemics (Kleinman and Watson 2006, 14). Sandra Hyde's ethnography on the emergence of HIV/AIDS in Yunnan Province, China (2007) explores how the Chinese state's efforts to assess the threat of HIV mapped disease onto risky bodies instead of highlighting risky behavior. In doing so, the Chinese state recapitulated existing, historically-derived categories of risk associated with ethnic, borderland identities instead of identifying practices leading to the spread of HIV. Most recently, *Anthropology and Medicine* (2008) has highlighted the "social, cultural, political and economic factors that must be considered in developing biosocial approach to pandemic influenza in Asia

(1). In China, Zhang and Pan (2008) examine local responses to the threat of avian influenza in Hainang County, Zhejiang Province, juxtaposing media representation and state responses with local farmer and cadres perceptions. Liu (2008) investigates the poultry farming practices, culinary traditions, and local appetites in Hong Kong that have led to continued concern of a pandemic outbreak. I situate my investigation of avian influenza pandemic preparedness in Hong Kong-SAR within this body of literature to consider broader social issues and theoretical concerns.

I arrived in Hong Kong (香港 Fragrant Harbor) for my field research on July 1,

The Fragrant Harbor, Methods, and Thesis Organization

2007, amid the fireworks celebrating the ten-year anniversary of the Hong Kong Hand-Over to the PRC and consequently, the ten-year anniversary of the first human cases of avian influenza. The celebration marked an uneasy return of Hong Kong to the Mainland, after a period of almost 160 years of British rule. When the British first began occupying Hong Kong Island in 1841, the island was soon thereafter described as "a place with nothing to recommend" (Hong Kong 1845) it being occupied only by a "few fishermen, stone-cutters, and farmers" (Hong Kong 1948). Victoria Harbor's natural depth, however, made it an attractive site for British military and commercial pursuits. The Colony grew in three marked waves (Figure 1). The cession of Hong Kong Island to the British crown was made official by the Treaty of Nanking in August 1842 after the First Opium War (1839-1842). Following the Second Opium War (1856-1860), the British gained the southern tip of the Kowloon Peninsula and Stonecutters' Island through the Convention of Peking in 1860. Finally, the New Territories were leased to the British in 1898 for a period of 99 years (see Carroll 2007). The territory remained under British rule,



Figure 1 Map of Hong Kong detailing the three waves of British acquisition of the territory.

excluding the Japanese Occupation of Hong Kong during World War II (December 25th, 1941 to August 15th, 1945), until the lease on the New Territories expired at midnight on July 1, 1997. Today, Hong Kong is renown as one of the 'Asian Economic Tigers' and can be thought of as what Saskia Sassen (2001) has called the 'global city:' a site for the complex organization of spatially dispersed factories, offices, and services and the production of financial markets that are deeply integrated in the global arena. Hong Kong's legacy as a British colony has set it apart from the rest of China, as a special zone of governance and global commerce, to remain under special autonomy until 2047.⁶

⁶ Preparations for the 'hand-over' of Hong Kong to the People's Republic of China started in 1979 and were worked out during the early 1980s in a series of meeting led by British Prime Minister Margaret Thatcher, PRC Premiere Deng Xiaoping, and Hong Kong Governors Murray MacLehose and Edward Youde. Negotiations lasted until 1985, with the British eventually agreeing to return not only the New Territories but also Hong Kong Island and Kowloon, which were ceded to the British, not leased like the New Territories, and therefore did not need to be returned. Toted under the 'One Country, Two Systems' policy, the classification 'Special Administrative Region' was created so that China could not simply strip

As an honorary research assistant at the Chinese University of Hong Kong's School of Public Health (CUHK-SPH), I spent three months interviewing health researchers and officials, reading journal and news articles, conducting extensive archival research, and noting observations. Located at the Prince of Wales Hospital (Shatin, New Territories), the CUHK-SPH provided me with an ideal environment for discussing ideas with health researchers, participating and observing seminars and lectures, and gaining vital contacts. While in Hong Kong, I conducted nine formal interviews with a variety of health researchers and authorities, including a microbiologist, a nurse, a risk communication specialist, a hospital administer, and several officials at the Hong Kong Centre for Health Protection (CHP). Through contacts at CUHK-SPH, I also spent a week interviewing nine health authorities at the Shenzhen Center for Disease Control and Prevention (CDC) and conducted two interviews with health authorities in Beijing.

Chapter 1 introduces the pandemic preparedness project in Hong Kong-SAR. I first examine the logic of preparedness as laid out in Hong Kong's preparedness plan (2005b) and explained to me by officials at the Centre for Health Protection. Drawing from Sandra Hyde's (2007) idea of "everyday AIDS practices," I examine "everyday preparedness practices": practices fashioned by the state that seek to forestall an avian influenza pandemic and instill a particular understanding of disease despite low incidence. I document how these practices are enacted at borders, through space, and in people.

Hong Kong of rights enjoyed under British rule. The nearby Portuguese colony of Macau also negotiated SAR status for its hand-over to the PRC on December 20, 1999. Unlike many colonies that were given self-autonomy after colonialism, both Hong Kong and Macau are post-colonial territories that have been given over to another governing body.

A review of governmental annual reports starting from the founding of the colony in 1842 traces the changing ways in which infectious diseases have been thought of and managed by the state in Hong Kong (Chapter 2). My historical review combines the pathological and ideological events that have catalyzed these changes (Johnston 1995), tracing the shifting line within an account of state-championed sanitary subjects and their unsanitary counterparts. I divide my historical review into four overarching time periods: (1) colonial medicine founded on miasma theory and racialized subjects (1842-1880), (2) the introduction of a new sanitation based on germ theory (1881-1940), (3) a period marked by tremendous growth and a steep decline in infectious disease prevalence (1945-1997), and finally, (4) the return of infectious diseases as a significant healthcare challenge in the post-hand-over period (1997 to the present).

I return to the present through a short vignette that examines the discovery of H5N1 in ducks and geese in the nearby Mainland district of Panyu (Chapter 3). As opposed to everyday preparedness practices that form most preparedness practices in the present, the Panyu H5N1 outbreak highlights the social frictions that occur when state preparedness measures go beyond the everyday. The Panyu H5N1 outbreak also calls attention to a discursive tendency to treat the state and its actors as one and the same. Interviews with state healthcare workers in Hong Kong reveals a more nuanced perspective, revealing that state actors' perception and personal practices are not exactly aligned with official state pandemic preparedness discourse (Chapter 4).

My last chapter provides a brief counterexample by examining preparedness practices taking place in the Shenzhen Special Economic Zone (PRC), the Mainland metropolis that borders Hong Kong immediately to the north. Despite their proximity, avian influenza pandemic preparedness was enacted and perceived in contrasting ways. Through my discussion, I highlight these differences, bringing into relief the social production of disease.

My investigation of avian influenza pandemic preparedness in Hong Kong-SAR examines the uncertainty posed by a virus that has yet to reach its ascribed pandemic potential. Despite continued low human incidence, avian influenza remains a risk that must be curtailed by preparedness measures. As a decidedly top-down, state-fashioned social project, the state and its actors form an imperative level of investigative inquiry. My investigation brings together an analysis of state discourse and practice, as seen through state policies, public health campaigns, and media representations, with a discussion of the perceptions and practices of the state healthcare actors that create avian influenza preparedness policies in order to elucidate how both confront the uncertain. In doing so, I do not mean to downplay the importance of the risks posed by an eventual outbreak or the objective changes that are occurring to a virus that has been labeled H5N1. As a student of anthropology, what I find important here is the logic and practices that form pandemic preparedness in Hong Kong that work to engage uncertainty presented by H5N1 and, in turn, make this object of research real.

Chapter One: Enacting Preparedness in Hong Kong

Stepping onto the elevated platform of the Kowloon-Canton Railway (KCR) station, I glanced over the bustling morning traffic that efficiently maneuvered between tall buildings on neatly organized streets already filled with cars, buses, and pedestrians. The buildings vied with the jagged hills in the background for a piece of the spotless blue horizon, creating a seemingly continuous urban mountain composed of glass, concrete, and tropical foliage. Despite the lack of clouds, a thick humidity dampened the sun's rays but did little to alleviate the stifling heat. I quickly found myself sweating and looking forward to the relief of the hospital's air-conditioning. My fellow travelers, obviously accustomed to July in Hong Kong, were well prepared with an assortment of umbrellas, face-cloths, and water bottles.

I walked the short distance from the KCR station to the hospital's back entrance. Upon entering I was instantly drawn to a sole television stationed in the middle of the busy corridor, facing in-coming visitors and staff. The television played several avian influenza health advertisements, presenting each advertisement first in Cantonese and then in English.¹ The advertisements were colorful and entertaining, conveying messages on how to wash hands properly, maintain a hygienic house, and recognize potential

¹ Television health advertisements are a ubiquitous part of TV viewing in Hong Kong. Health advertisements are managed by the Centre for Health Protection (CHP), a section of the Hong Kong Department of Health. Advertisements can be found on the CHP website at: <u>http://www.chp.gov.hk/content.asp?lang=en&info_id=10094</u> (accessed: February 12, 2008). Besides advertisements for a variety of communicable and non-communicable health concerns, the CHP has produced seven advertisements on avian influenza and influenza in general (<u>http://www.info.gov.hk/info/flu/eng/video.htm</u>; accessed February 12, 2008). All videos were produced in both Cantonese and English versions. Advertisements are featured not only during television programming, but also on monitors at hospitals and the Health Department lobbies, border checks, and various modes of transportation, such as the Hong Kong-Macau Star Ferry. influenza symptoms, among other helpful prevention information.² Meandering through the hospital, I found this information reiterated in various forms: hand sanitation stations conspicuously dotted the walls, posters diagramed proper hygiene methods and outlined important points related to avian influenza, notices alerted people to up-coming sanitation workshops and events, and vending machines sold facemasks at hospital entrances.³ Upon exiting the hospital, I was confronted by a large door-sized billboard, which declared: "The Alert Response Level has been activated." Pausing to read over the large sign amid a steady flow of human traffic, I wondered what this amalgamation of signs, materials, and accompanying practices indicated about the Alert Response Level and pandemic preparedness in Hong Kong.

In this chapter, I introduce pandemic preparedness in Hong Kong by examining preparedness logic, as articulated in the report *Hong Kong's Preparedness for Influenza Pandemic- Prevention and Protection* (2005b), and how this logic is enacted in three investigative domains: borders, space, and people. I take borders to be symbolic representations of limits that provide a means of classification and ordering (Heiberg 1989 from Berdahl 1999, 5), with particular note to the classification of geo-political space. Although borders serve as demarcations of space, distinguishing what is inside from what is not, I highlight how human practices, such as disease surveillance, can serve as powerful tools for shaping people's thoughts and actions that go beyond territorial boundaries (Zhang 1999, 7). I use Victor Turner's (1967) concept of liminality, the middle state in rituals characterized by ambiguity, openness, and indeterminacy before a

² Several people I interviewed told me with pride that Hong Kong's health advertisements had won various international awards.

³ The hospital also had posters on other health concerns. Posters on sanitation and avian influenza prevention, however, were the most numerous.

person can reintegrate into society, as an entry for understanding the difficulty of maintaining pandemic preparedness alertness in people's thoughts and practices. I argue that the high degree of uncertainty surrounding avian influenza engenders a suspended liminal state of alertness that can only end with the arrival of a pandemic.

My discussion of borders, space, and people emphasizes pandemic preparedness practices that reside in the everyday. In her ethnography on the emergence of HIV/AIDS in Yunnan, China, Sandra Hyde (2007) merges Pierre Bourdieu and Michel de Certeau's understandings of "everyday practices" with Foucault's theories on discursive practice and biopower to examine "a whole array of practices, thoughts, policies, words, and actions involved in a discussion of HIV/AIDS" (Ibid, 13). As a sometimes inconspicuous yet ubiquitous project in Hong Kong, a discussion of pandemic preparedness necessitates an examination of a similarly broad range of discursive fields, grounded in an investigation of the everyday. I posit that 'everyday preparedness practices,' as enacted at borders, across space, and through people, not only allows for the avian influenza paradox to remain overlooked, but permits avian influenza to exist as a powerfully real social entity despite the continued absence of confirmed human cases.

The Logic of Preparedness

The humble building that houses Hong Kong's Centre for Health Protection (CHP) obscures its courageous and immense mission: to "achieve effective prevention and control of disease in Hong Kong" by tackling health threats and responding to outbreaks of infectious disease "in collaboration with local and international stakeholders" (Centre for Health Protection 2007, 29). Located in one of the most densely populated areas on earth, the CHP opened in June 2004 as part of the far-reaching post-SARS health restructurings. The Centre was made responsible for the coordination of different

governmental departments along with various societal sectors in the fight against infectious diseases, particularly in forming avian influenza pandemic preparedness policies and protocols.

When I visited the CHP in August 2007, the Centre was still under construction, although most of the central offices and the pandemic command center were already occupied and fully operational. Upon my arrival, I was quickly ushered into an empty conference room, elegantly furnished with a large dark wood table, high leather chairs, and the latest in presentation and communication technology. Two officials soon arrived and presented me with a small stack of literature on avian influenza before proceeding to a well-rehearsed PowerPoint presentation. One of the officials used a slide displaying a simple line graph to explain pandemic preparedness as follows:

Emergency preparedness is just to have a timely response to any crisis and to accelerate the community's return to normalcy... We can divide [the development of the crisis] into pre-crisis period, crisis period, and, after the crisis occurs, the crisis transition period before things return to normalcy. So in the pre-crisis period, we are taking all kinds of preventive actions and doing everything to recognize any problems. And in the warning period we just try to detect the early warning signs; that's what the purpose of this surveillance is...And in the crisis period, our emergency response engines are very important to contain any damage. And in the post-crisis period, we try to evaluate the lessons learned and to prevent that crisis from occurring again (Appendix 1).

As seen here, while semantically "preparedness" suggests actions undertaken prior to an event, pandemic preparedness concentrates on setting up practices that will come as a *response* to disease outbreak. As opposed to other health crises, avian influenza's short temporal lag between initial infection and peak number of people infected provide health authorities with a key window for intervention.⁴ It becomes the responsibility of the state

⁴ The CHP health officials differentiated infectious disease outbreaks, such as avian influenza from other crises, such as airplane crashes or terrorist attacks. See Appendix 1.

to take advantage of this characteristic by establishing systems that can quickly and efficiently detect and intervene upon influenza outbreaks as they appear.

In his historical analysis of the development of statistics, Ian Hacking (1990) concludes that modern statistics 'tame' chance once statistics are not only used for the prediction of phenomenon but also for their explanation. The risk associated with avian influenza provides a perfect example of this point. Drawing from the logic outlined above, pandemic risk can be seen as two-fold: (1) the uncertain risk posed by avian influenza, the biological entity, and (2) the risk of not preparing. While science attempts to ascertain the former more clearly, most preparedness actions concentrate on the latter, shifting the focus away from the virus and into the realm of human practice and governance. Within this logic, the state should not wait for the emergence of avian influenza to become a virus that can infect humans for it to become a real social entity. Biological pandemic risk is remolded into a state responsibility, so that 'chance,' or here, the risk of a pandemic, is not only used as a predictor of what is to come but also as an explanation for the need for pandemic preparedness in the present.

Inline with the World Health Organization's (WHO) guidelines on preparedness, *Hong Kong's Preparedness for Influenza Pandemic Prevention and Protection* (Hong Kong 2005b) is based on a three-tiered response system, Alert, Serious, and Emergency, that encompasses 23 different "risk-graded epidemiological scenarios" (Ibid, 20). These scenarios differentiate the appearance of highly pathogenic avian influenza (HPAI) along three overarching distinctions: (1) The appearance of HPAI within or outside of Hong Kong-SAR, (2) Detection of HPAI in humans or non-humans, and (3) Evidence of efficient human-to-human transmission. For example, confirmed avian influenza

outbreaks in poultry populations outside of Hong Kong warrant an 'Alert Response Level' (Hong Kong *unknown*, 31), but once there is a confirmed outbreak in the environment or poultry population within Hong Kong, the response level is raised to 'Serious' (Ibid, 38). The response level reaches the 'Emergency Response Level' once evidence of efficient human-to-human transmission is found within or outside of Hong Kong (Ibid, 44). The Plan details a series of escalating public health responses for each response level, detailing particular actors and organizing bodies that will be made responsible under specific scenarios.

In the absence of a significant avian influenza outbreak, Hong Kong's health system remains wholly in the pre-crisis period. As such, the Preparedness Plan is created outside of the crisis-evaluation framework, that generally takes place in the post-crisis period. How then do health researchers and officials access what are the most appropriate surveillance systems and avenues for response? This happens in at least three ways. First, history serves as a critical idiom for understanding uncertainty on which preparedness measures are founded. Health researchers and policy makers call upon the cache of accumulated experience of dealing with other infectious disease outbreaks in the past as a substitute for avian influenza.⁵ The 2003 SARS pandemic is the most important of these, serving as a foundational event for pandemic preparedness in Hong Kong, as well as for the WHO and individual nation-states. Second, Hong Kong serves as a global center for research and collaboration.⁶ Although birds have tested positive for H5N1 in Hong Kong,

⁵ I found this to also be the case in my review of WHO avian influenza preparedness literature. Furthermore, most scientific articles I read called on the history of influenza pandemics of the twentieth century as a means of opening a discussion on current scientific work.

⁶ Suspected cases of H5N1 only become official cases once viral samples are diagnostically confirmed at a WHO H5 Reference Laboratory. Worldwide, there a total of eight WHO H5 Reference Laboratories: two in the United States (Atlanta & Memphis), two in Europe (London, UK & Paris, France), two in Hong Kong, one in Japan (Tokyo), and one in Australia (Parkville, Victoria). All Reference Laboratories are units unto

since 2003, there have been no confirmed human cases, setting Hong Kong as an international model to be followed. Furthermore, many health researchers and policy makers have joint appointments with the WHO and are used as consultants for outbreaks worldwide. International connections allow for Hong Kong to participate in outbreak control and post-crisis assessment elsewhere, gaining valuable insight into preparedness without incurring damages from outbreaks within its territory.⁷ Finally, preparedness plans are enacted through practice drills that "test... contingency plans" (South China Morning Post September 22, 2007), creating a *faux* post-crisis period of assessment.⁸ A microbiologist I interviewed stated that although these tests could not be applied to the individual level, they were particularly useful in testing the flow of information and communication between departments. As such, preparedness plans are not merely paper documents but are carefully scripted events, rendering information on how these plans can be improved. In drawing from these alternative sources of information, health researchers and officials circumscribe the uncertainty that continues to mire HPAI's pandemic potential to form preparedness practices that aim to mitigating future damages.

Enacting Preparedness

What constitutes 'proper preparedness' in Hong Kong? And how does the logic articulated in *Hong Kong's Preparedness for Influenza* (2005b) and other official documents become translated into everyday practices? I now turn to an examination of

themselves and serve a collaborative role with the WHO for the global detection of new avian influenza cases (<u>http://www.who.int/csr/disease/avian_influenza/guidelines/referencelabs/en/;</u> accessed March 2, 2008) as part of the Global Influenza Surveillance Network (GISN)

^{(&}lt;u>http://ww.who.int/csr/disease/influenza/surveillance/en/;</u> accessed March 2, 2008). Several informants told me that Hong Kong's laboratories, being situated proximally to major outbreaks in Indonesia and Vietnam, are the most important of the eight.

⁷ One informant told me: "Our experts have had a lot of input into the WHO guidelines... and are party to whatever expert panel or for making those resolutions."

⁸ For official press release of Operation Chestnut, see:

http://www.info.gov.hk/gia/general/200709/21/P200709210205.htm (accessed: June 2, 2008)

everyday preparedness practices, as they are found at borders, across space, and through people.

Borders

As stated in pandemic preparedness documents, territorial borders play a vital role in the assessment of pandemic risk in Hong Kong: borders distinguish outbreaks that occur inside and outside of the territory, representing differing degrees of risk. This difference is encapsulated in the move between the Alert and Serious Response Levels, which necessitates differential responses.

Hong Kong's current borders are a result of expanding nineteenth century British colonialism in Asia (see Introduction; Figure 1). Although the British officially relinquished sovereignty to the People's Republic of China (PRC) on July 1, 1997, the hand-over agreement stipulated that the former colony would retain partial autonomy from China as a "Special Autonomous Region (SAR)" for a period of 50 years. As a result, Hong Kong's Health Authority, and other governmental departments, functions separately from its Mainland counterparts. Hong Kong has 733 kilometers of coastline and an additional 30-kilometer border with the Mainland metropolis of Shenzhen. It is thus possible to enter Hong Kong via land, sea, and air.⁹ The volume of people entering and leaving is simply phenomenal: in 2006, the number of people that entered Hong Kong exceeded 202 million, approximately three quarters of which entered by land via the Chinese Mainland (Hong Kong 2007).^{10,11} The same year, approximately 47.8 million

⁹ Hong Kong has 11 official entry and exit control points: one international airport, six land border crossings, and four docking terminals (<u>http://www.immd.gov.hk/ehtml/immdctlpts.htm</u>; accessed February 14, 2008).

¹⁰ To put this into perspective, this figure is almost thirty times the population of Hong Kong, which was estimated at 6.9 million at the end of 2006 (Hong Kong 2007). In other words, on any given day of the year, the amount of people visiting Hong Kong is over half a million, assuming that approximately the same amount of people visit on each day of the year.

passengers traveled through Hong Kong International Airport on approximately 295,600 flights.¹² Infrastructure and staff that police the border must therefore efficiently handle a high-volume of people moving both into and out of Hong Kong, traveling to a diversity of locations using various modes of transportations.

Multiple border controls seek to prevent the importation of avian influenza into Hong Kong. Controls work in two veins along the boundary separating human and nonhuman, another border delineating different degrees of risk as laid out in the official documents on pandemic preparedness. Surveillance of human traffic crossing territorial borders is done primarily through unobtrusive temperature checks, which utilize infrared technology to detect travelers with temperatures over 38 degrees centigrade. Bordercrossers are required to self-declare any irregular symptoms and recent visits to farms outside of Hong Kong. As people move through border controls, they are exposed to a variety of health messages, including information on avian influenza and pandemic preparedness. Health messages are disseminated through television monitors playing health advertisements, brief messages over public announcement systems, and an assortment of posters and pamphlets, some available in up to 22 languages.

Although H5N1 has been shown to infect a variety of animals (Songserm et al. 2006), chickens are the most important non-human hosts that come under surveillance and control.¹³ Hong Kong's vibrant poultry industry produces 25,000 chickens daily,

¹¹ There are several ways of entering the Mainland by land. There are several pedestrian border crossings, four vehicular entry points, and two KCR routes both connected to Shenzhen's metro system. MTR Properties, the company that manages the Hong Kong metro system, estimates that 275,000 people use the KCR to cross the border on a daily basis (<u>http://mtr.com.hk/eng/investrelation/patronage.php</u>; accessed: February 12, 2008).

¹² <u>http://www.hongkongairport.com/eng/pr/pr_915.html</u> (accessed: February 12, 2008)

¹³ The importation of H5N1 via other avian carriers is worth noting. Bird keeping is a time-honored hobby in Hong Kong. Exotic wild birds are also purchased, both legally and illegally, as part of this past time. Migratory wild birds that fly into Hong Kong also pose a threat of importing HPAI outside of surveillance

grossing an estimated \$340 million in 2007.¹⁴ Locally produced poultry, however, accounts for just over half of all poultry consumed in Hong Kong.¹⁵ Because of the Cantonese culinary preference for freshly killed meat over frozen products, many chickens are alive when they enter Hong Kong, and must therefore undergo a stringent series of tests and the administration of vaccines as they journey across the border (Liu 2008). Hong Kong health authorities have also developed rigorous product labeling so that potentially infected products from the outside can be tracked to their source.¹⁶

Border crossings are important points for averting the importation of avian influenza and the maintenance of the Alert Response Level. With more lenient economic and travel policies stemming back to the Deng Xiaoping's Open-Door Policy of the late 1970s, borders are being challenged by continually increasing mobility between Hong Kong and the Mainland, particularly with Hong Kong's contiguous neighbor, the city of Shenzhen.¹⁷ Several of the health researchers at the School of Public Health where I

networks. This is particularly important given that Hong Kong lies along the flight paths of several migratory birds. Signs posted throughout Hong Kong advice people to stay away from wild birds (<u>http://www.info.gov.hk/info/flu/eng/pst/wildbird.htm</u>; accessed: February 18, 2008). If a dead bird is found, the Centre for Health Protection has a 24-hour hotline that contacts a team of specialists that will dispose of the dead body and determine the cause of death. As a result, various cases of H5N1-infected birds have been discovered throughout the territory

^{(&}lt;u>http://www.afcd.gov.hk/english/publications/publications_press/publications_press.html;</u> accessed: February 18, 2008).

¹⁴ There were 146 active chicken farms in 1997, all of which were located in the New Territories (Kung et al. 2007).

¹⁵ http://www.afcd.gov.hk/english/agriculture/agr_hk/agr_hk.html

¹⁶ Found at both enclosed super-markets and also stalls at open-air and semi-open-air markets. Frozen chicken is easier to import, and in my outings, I found chickens originating from a diversity of locations, such as the United States, Canada, and Brazil. Place of origin labeled on frozen chicken packaging, even at market stalls.

¹⁷ Crossing the border is different for residents of Hong Kong and people from Mainland China. While residents of Hong Kong can easily attain identification material to enter China, Mainland residents must apply for special exit-entry permits in order for them to visit the Special Administrative Region. The possibility of obtaining such a permit differ according to purpose of travel, treating business travelers, tour groups, and individual visitors differentially, with travelers from Guangdong and 28 major Mainland cities being able to obtain expedited permits. Mainland residents not from one of these 29 cities must acquire permissions from their place of origin, as noted in their household registration book ($\beta^{2} \Box$). This process generally takes at least a month and may be in vein.

conducted my field research were among these border-crossers: Dr. Wu, an epidemiologist simultaneously holding a post-doctoral position and an appointment in the Department of Infectious Disease Control in Shenzhen, spent Monday through Thursday in Hong Kong and the weekends at home in Shenzhen; Ms. Shao, a biostatistician, was completing her doctoral degree and often returned to Guangzhou to visit her 4 year-old son; Ms. Yan, a former Chinese Health Ministry worker frequently traveled back to Beijing to spend time with her husband and extended family. Recent news articles in Hong Kong report on increasing cross-border trading and travel, and have even reported on the proposition to create a Hong Kong-Shenzhen megalopolis through the more significant breakdown of territorial borders (*South China Morning Post* August 20, 2007). *Space*

Hong Kong's physical space is a unique blend of modern urban centers and wellpreserved subtropical environments. Covering an area of 1,104 square kilometers, the territory is composed of the Kowloon Peninsula and over 260 islands, with Hong Kong and Lantau Island being the two largest (see Figure 1). Although the tightly packed highrises that line both sides of Victoria Harbor have come to iconize modern Hong Kong, less than 25 percent of the territory is classified by the state as developed. Of the remaining area, 40 percent is maintained under governmental protection as country and marine parks.¹⁸ The concurrence of developed and undeveloped spaces in Hong Kong is heightened by an extensive and efficient transportation system, constructed largely in the decades following World War II as a means to accommodate a massively expanded population and create industrial centers in unused regions of the New Territories (see Chapter Two). Today this transportation network covers the territory, allowing people to

¹⁸ <u>http://www.gov.hk/en/about/abouthk/facts.htm</u> (accessed: February 23, 2008);

http://discoverhongkong.com/eng/touring/hiking/index.jhtml (accessed: February 23, 2008)

travel great distances for work, school, shopping, and a variety of outdoor recreational activities.¹⁹

Like borders, the management of spaces classified as developed or undeveloped is fundamental to pandemic preparedness. As the state seeks to act within the short temporal window between initial outbreak and the peak number of people infected, maximizing outbreak detection is critical for minimizing the time before interventions occur and outbreaks are contained. Good surveillance is seen as the "cornerstone for effective communicable disease control" (SARS Expert Committee 2003, 115). It is imperative that surveillance networks cover both developed and undeveloped spaces: an incomplete surveillance system presents a risk that an avian influenza outbreak may go undetected in hidden niches created by contrasting urban and natural landscape. During its first three years of operation (2004-2006), the CHP's primary objective was to build infrastructure that would serve its long term goals of infectious disease prevention and control, following strategic directions known as the three R's: real-time surveillance, rapid intervention, and responsive risk communication (Centre for Health Protection 2007, 39). Infrastructure has heavily concentrated on the "expansion of the disease surveillance network with the aid of information technology, enhancement of public health laboratory services and infection control capacity, development of emergency preparedness and response plans, and establishment of collaborative partnerships" (Ibid, 5). In order to more efficiently manage space and survey the territory, the Hong Kong Health Authority

¹⁹ For example, the Mass Transit Railway (MTR) Properties estimates that 3,544,000 people use the Hong Kong metro system during weekdays (<u>http://mtr.com.hk/eng/investrelation/patronage.php</u>; accessed: February 12, 2008). A passenger riding from Hong Kong Island Central station to the Lo Wu Mainland border crossing will pay 43.5 HKD and expect an hour train ride with only one transfer (<u>http://www.mtr.com.hk/jplanner/eng/planner_index.php?spot=1&start=15&destin=76&x=74&y=13</u>; accessed: February 24, 2008).

has divided the territory into seven distinct organizational units, termed 'health clusters.'^{20, 21} Each health cluster is responsible for surveillance over its area and reporting findings back to the CHP.

Surveillance networks rely on laboratory tests that confirm cases of H5N1 in both humans and non-humans. While tests are becoming more reliable and time-efficient, laboratory testing is an inherently time-consuming and limited endeavor. At present, H5N1 confirmation can be attained in approximately 24 hours, but only samples brought to the laboratories can be tested (Personal communication). Relying solely on laboratory tests before initiating interventions risks widespread infection occurring while awaiting test confirmation or through cases missed by laboratory surveillance systems. Moving beyond the laboratory and discrete categories of disease that have traditionally informed surveillance, health researchers now look to gather a wider array of information that could signal the beginning of an outbreak. For example, historical reviews of influenza epidemics show that different waves within an influenza pandemic generally affect different age groups. Children and the elderly are generally prone to higher levels of mortality and morbidity as compared to other age groups, so that surveillance of these two populations serves as a vital indicator for the emergence of a pandemic (World Health Organization 2005). In addition to information collected at hospitals and community clinics since 2004, Hong Kong health authorities have collected information

²⁰ Those clusters are: Hong Kong East Cluster (HKEC, 7), Hong Kong West Cluster (HKWC, 7), Kowloon Central Cluster (KCC, 6), Kowloon East Cluster (KEC, 3), Kowloon West Cluster (KWC, 7), New Territories East Cluster (NTEC,7), and New Territories West Cluster (NWTC, 4). Numbers represent the number of hospital in each cluster

⁽http://www.ha.org.hk/hesd/nsapi/?MIval=ha_visitor_index&intro=ha%5fview%5ftemplate%26group%3d OSR%26Area%3dHNI; accessed: February 8, 2008)

²¹ These divisions follow the internal division of Hong Kong into three general areas: Hong Kong Island, Kowloon, and the New Territories. These divisions are almost exactly in accord with the three waves of colonial expansion described in the Introduction (see Figure 1).

from childcare centers and elderly homes as important baseline indicators of disease activity. A cluster of absenteeism in a particular school or high fevers in an elderly home may provide crucial early warning signals that health authorities can act on. Furthermore, globally, health researchers have created a purposefully ambiguous disease category: influenza-like illness (ILI). The diagnostic benchmarks of ILI are the sudden onset of a cough, fatigue, and a fever of over 38 degrees Celsius. ILI captures a range of respiratory diseases that are not exclusively caused by influenza viruses and allows health authorizes to institute simple, unobtrusive checks. Further tests assess potential and suspected cases, so that contacts, and potential infections, are curtailed (Hong Kong 2005b, 4). Surveillance has also come to include reading signs that are not strictly epidemiological. The post-crisis evaluation of SARS in Hong Kong, conducted by the SARS Expert Committee,²² found that media articles reported strange activities in Guangdong Province long before health authorities even became aware of the SARS outbreak (SARS Expert Committee 2003, 13).²³ A CHP health worker told me: "We spend more time to do the media monitoring every day after SARS... We sometimes start our disease investigations just based on the media monitoring." Media monitoring provides health authorities with information that might indicate abnormal disease patterns. While laboratory confirmation remains the gold-standard for H5N1 diagnosis, health authorities have devised several additional methods of surveillance that may lead to quicker detection and intervention.

Surveillance and other preparedness practices distinguish Hong Kong from its Mainland and other regional counterparts. Despite stringent border controls and surveillance networks, Hong Kong is still at risk of diseases arising in spaces beyond its

²² <u>http://www.sars-expertcom.gov.hk/eindex.html</u> (accessed: April 24, 2008)

²³ Of particular note was the large-scale buying and boiling of vinegar to treat an unknown respiratory disease.

borders that are devoid of such preparedness practices. The establishment of collaborative partnerships with regional affiliates expands the scope of surveillance and minimizes risk (Centre for Health Protection 2007, 5). For example, in May 2003, the 'Guangdong-Hong Kong-Macau Expert Group on Prevention and Control of Infectious Disease' was formed in order to more thoroughly monitor disease in the Pearl River Delta Region. Liaisons have required professional and informal exchanges, as explained to me by a CHP worker who participated in cross-border partnerships:

If you do business with Chinese people, it is important to cultivate these relations. Every year we meet each other in several meetings, some are bigger some are smaller, and we get to know each other. In case there is something suspicious going on, I just call my Guangdong counterpart and he'll find out if there is anything wrong for me.

Forming partnerships across borders and spaces has had the desired effect of shaping the way that preparedness and surveillance is happening in spaces outside of Hong Kong. Collaborations have fueled a steady stream of Mainland researchers studying in Hong Kong and abroad, returning with new tools for improving healthcare and surveillance; visitors from Hong Kong and elsewhere have also gone to the Mainland to develop infrastructure and infectious disease protocols. Health authorities have witnessed the adoption of their practices in the Mainland, such as the practice of media monitoring.

And because of our practice[s], [now] our Guangdong and Macau counterparts also did this media monitoring in their territory, in their region. And they will share with us their media monitoring results everyday so we can know what is happening in their places, even if we cannot access their newspaper.

Regional partnerships have facilitated the movement of health researchers and authorities across borders. In doing so, ideas and practices of preparedness have also made it across, changing pandemic preparedness in places territorially outside Hong Kong.

While political and socio-cultural spaces may be defined by territorial borders,

space, much like disease, is not so easily bound. In *The Production of Space*, Henri Lefebvre posits that real, lived social space is produced by concrete human practices and serves as a powerful tool in shaping people's thoughts and actions (from Zhang 1999, 7). Surveillance and other preparedness practices in Hong Kong serve to produce a space where a specific type of preparedness is occurring. As seen here, this space is not strictly defined by territorial borders: in moving to regionalize infectious disease surveillance and pandemic preparedness in the Pearl River Delta Region, practices are being transposed across borders, engendering particular social spaces more akin to those in Hong Kong. In terms of avian influenza, this has meant that pandemic preparedness practices are being extended beyond borders to create larger spaces more prepared for an outbreak.

People

The management of infectious diseases and health in Hong Kong has long been couched in a discussion of the 'problem of people' (see Chapter Two). At the end of 2006, the population was estimated at 6,900,700, with a constant growth rate of just above replacement since 2003.²⁴ Demographically, the population is shifting towards the elderly, although the median age remains at 39.6 years.²⁵ Hong Kong's average population density is estimated at 6,350 people per square kilometer and is ranked third densest globally (Hong Kong 2007). This figure however obscures the real distribution of the population, as urban centers attract huge aggregations of people while other areas are left fairly uninhabited. Kwuntong District of Eastern Kowloon has the largest population density in Hong Kong at 52,070 persons per square kilometer; some islands and areas of the New Territories have very few to no inhabitants (Hong Kong 2007).

²⁴ <u>http://www.unescap.org/stat/data/apif/2006/Hong-Kong-apif2006.pdf</u> (accessed: May 18, 2008).

²⁵ As described above, influenza epidemiology targets the young and the elderly as important groups to survey. In Hong Kong, 13.7 percent of the population is under the age of 15 and 12.4 percent of the population is over 65 (Hong Kong 2007).
The stockpiling of material goods, such as vaccines, anti-viral medication, and personal protective equipment (PPE), are frontline tools in reducing the risk of human infection (World Health Organization 2006, Chapter One).²⁶ The WHO has argued that the administration of drugs is the most efficacious measure for combating influenza pandemics (Ibid, 45) and the people I interviewed also expressed this view. In preparing for an influenza outbreak, Hong Kong health authorities have followed this suggestion by stockpiling drugs and vaccines. In the current pre-crisis, Alert Response Level period, medical resources are allocated to at risk groups, such as poultry farmers, health care workers, and the elderly, who receive annual influenza vaccinations at low or no cost.

Ultimately, materials are limited resources; the government cannot stockpile sufficient amounts of vaccines or drugs in order to treat everyone. The widespread distribution of health advertisements allows health authorities to reach the public with the goal of increasing public knowledge about avian influenza and instilling hygienic practices that seek to prevent disease emergence and transmission between people. Messages are conveyed through television health advertisements, posters, pamphlets, and community out-reach presentations and programs.²⁷ While messages vary in format and content, together, they present an unwavering idea of sanitation and preparedness that concentrates on the following four points. First, when traveling outside of Hong Kong, people should avoid contact with birds and poultry, particularly high-risk non-human

²⁶ The main anti-viral drug that is being stockpiled is Oseltamivir. Oseltamivir inhibits influenza virus' neuraminidase extracellular proteins from binding to host receptors, thus preventing the virus from entering the hosts' cell (see Introduction footnote number one). Oseltamivir was developed by Gilead Sciences and licensed to the Swiss pharmaceutical and diagnostic company F. Hoffman- La Roch Ltd in 1996 (http://www.roche.com/med-cor-2006-04-19; accessed: November 24, 2006). Oseltamivir is marketed as *Tamiflu* (http://www.tamiflu.com/; accessed: November 24, 2006). In 2005, La Roch donated three million treatment courses of *Tamiflu* to the WHO, to form a 'rapid response stockpile' to be used in case of a future pandemic.

²⁷ <u>http://www.info.gov.hk/info/flu/eng/resources.htm</u> (accessed: February 12, 2008)

reservoirs of disease. Second, when in Hong Kong, people should continue to avoid contact with birds. If in contact with birds, whether as pets, at markets, or otherwise, people should remain cautious and employ basic hygienic practices. Third, people should observe good personal and environmental hygiene, by washing hands thoroughly, avoiding crowded places, and properly disposing of refuse.²⁸ And four, if influenza-like symptoms occur, people should wear facemasks in order to avoid spreading potentially infectious particulars and consult a doctor. These points reiterate the overarching distinctions presented in official documents on pandemic preparedness, reshaping these distinctions into a series of knowledge and practices for the public to understand and follow.

Messages of sanitation, hygiene, and avian influenza preparedness are not limited to the state, however. Newspapers report the appearance of H5N1 in surrounding areas and on-going state preparedness measures. When riding the Mass Transit Railway (MTR), Hong Kong's now privately operated metro system, passengers are reminded that they should wear a facemask if they are experiencing influenza-like symptoms and are provided with specialized facemask disposal bins. An advertisement for the popular Hong Kong grocery store Park 'n Shop (*Taiyang Bao* August 07, 2007) offers chilled sesame chicken that has passed the "fresh check." Commercial enterprises seem especially eager to convince customers that products are safe for consumption. For example, with just over 50 restaurants in Hong Kong serving an estimated three million customers per month and plans to expand to 90 restaurants by 2009, KFC is keenly attuned to food

²⁸ <u>http://www.info.gov.hk/info/flu/eng/resources.htm#pamphlet</u> (accessed: February 14, 2008); <u>http://www.chp.gov.hk/files/pdf/English.pdf</u> (accessed: February 14, 2008).

safety concerns raised by avian influenza.²⁹ A disposable paper place-mat found on trays throughout the city and an accompanying pamphlet, both entitled "Step by step supervision towards food safety," outline eight steps that "ensure that all KFC meals are safe and delicious" (KFC 2007). Steps range from selecting "suppliers, raising and handling chickens, through to delivery, cooking, and in-store service" (Ibid). Both placemat and pamphlet make use of cartoon images, depicting a truck, a house with an egg in it, and a happy health inspector, along with photographic images of high-end technology that monitor chickens and their edible products. Cartoon magnifying glasses zoom in on an array of images: chickens in a field, a bucket of fried chicken, roasted chicken breasts, staff cleaning tables, and a cartoon stamp declaring "KFC: 100% 相信保 证" (100% Confidence Guarantee) . KFC further asserts that "all the chickens served by KFC are inspected and approved by concerned health authorities of origin and the Hong Kong Government" (Ibid).

In the absence of a major outbreak, messages that seek to convey knowledge and encourage certain practices seem to be overlooked in everyday life. This is yet another challenge faced by Hong Kong health authorities: alertness fatigue. People have become tired of continual health messages that attempt to instill alertness into the everyday. The CHP's Infectious Disease Controller told me in an interview that one of the most important challenges facing preparedness was: "How do we keep up with pandemic flu or avian influenza awareness and interest in the local population?" While new sanitary practices, such as more widespread use of facemasks, increased hand-washing, and the use of serving chopsticks, have seemingly taken root in post-SARS Hong Kong, many

²⁹ <u>http://www.investhk.gov.hk/PageControl/ShowDynamic464d.html?act=newsdetail&newsid=83</u> (accessed: March 14, 2008); <u>http://www.kfchk.com/eng/index.htm</u> (accessed: March 14, 2008)

other practices meant to prevent a pandemic from occurring appear to have declined, even among health care workers (see Chapter Three).

I read the difficulty of maintaining public interest and sustaining the Alert Response Level as indicative of the liminal state fundamental to the preparation for a future pandemic. The liminal state, as theorized by Victor Turner (1967), represents the period of ambiguity and openness that marks the movement between different phases of rituals and rites of passage. The concept of liminality has been extended to understand other periods of indeterminacy. In her study of understandings of risk associated with breast cancer, Sandra Gifford (1986) posits that medical risk produces liminal states for patients, separating what is healthy and what is not. A suspended state of alertness, as maintained by the Hong Kong Health Authority, similarly engenders a liminal space, between a healthy state and one that is potentially sick. Unlike Gifford's informants who are eventually diagnosed and treated or simply discharged, a prolonged emphasis on alertness signifies a liminal state that can only end with an avian influenza outbreak. Maintaining the liminality inherent in the 'state of alertness' has proven to be a difficult and costly endeavor. In the eyes of the state, however, not doing so would compromise preparedness, increasing the risk that a pandemic could occur.

Conclusion

After a short research trip in Mainland China, I returned to Hong Kong via the well-traveled public railway connection at Lo Wu, Shenzhen (see Figure 1). The signs of pandemic preparedness were omnipresent yet largely inconspicuous: a stand of health pamphlets stood full against a far wall, instructional posters occupied wall-space next to a barrage of advertisements, and infrared temperature detectors were positioned so that the steady flow of people could move through customs unimpeded. As I made my way to the

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KCR station, a poster I had not seen before captured my attention (Appendix 2).³⁰ The poster depicted a uniformed border officer facing a middle-aged woman of undisclosed origin but assumed lower social class. The officer holds a blue chicken with a gloved hand while the other hand points at the female offender, and by extension, the poster's audience who he is also facing. A rather large shopping bag that is literally, and somewhat comically, overflowing with poultry rests atop a metal inspection counter, separating the two people in the picture. The image is accompanied by the warning: "It is an OFFENCE to bring game, meat, and poultry into Hong Kong without official approval or health certification" (emphasis in original).³¹

In this chapter I have outlined pandemic preparedness in Hong Kong, with a focus on how preparedness is enacted through practices at borders, across spaces, and through people. This poster touches upon the different issues I have raised. Although the Hong Kong government recognizes the benefits for cross-border mobility, it is still imperative that people respect the safe space within Hong Kong created by health authorities through preparedness practices. Bringing game, meat, and especially poultry *into* Hong Kong without the established measures that check for HPAI presents a risk to preparedness. People must follow the messages conveyed by health authorities, or face stiff penalties and the possibility of endangering Hong Kong. Being able to understand messages is in large part based on the broad network of practices that are continually being established as part of the preparedness project. These practices, as I have tried to illustrate, do not

³⁰ This poster can be found on the CHP's website at: <u>http://www.info.gov.hk/info/flu/eng/pst/pst_10.htm</u> (accessed: February 12, 2008)

³¹ Attempts to transport small quantities of meat across the border are reported in the newspaper, if only in brief. For example: "More than 24kg of illegal fresh meat was seized at the Man Kam To border checkpoint in the past two days. Customs found 10.7 kg of chicken, 6.4 kg of mutton and 5 kg of pork in a Mainland woman's baggages at 11.30 pm in the arrival hall. Also, a Hong Kong woman was intercepted with 1.3 kg of pork and 700 grams of chicken on Monday" (*South China Morning Post* July 25, 2007).

only exist within the realm of the hospital, border checks, or the Hong Kong Centre for Health Protection, but encompass a large set of everyday practices that either directly or indirectly work to reify the understanding of preparedness and the need to be alert. Although everyday preparedness practices at times blend into the ordinary, I argue that their ubiquity and normalcy is precisely what has allowed avian influenza to become a socially real entity in Hong Kong.

Chapter Two: Lest History Repeat Itself

Voice Over: To prevent avian flu, you should wash hands frequently, maintain a clean environment, and ensure good ventilation. Cover mouth and nose with tissue paper when coughing or sneezing and dispose of soiled tissue paper properly in a lidded rubbish bin, then wash hands immediately. People with flu symptoms, caregivers of patients, and visitors of hospitals or clinics should wear a mask. And, avoid crowded places.

A group of four adults surrounding a male doctor with a young boy in the foreground (together): Take action now!

Voice Over: Be prepared. Act now to prevent influenza.¹

In clear contrast to the woman and her multitude of chickens apprehended at the

border, the people presented in this television health advertisement demonstrate correct

preparedness behavior: frequent hand-washing, hygienic environmental awareness, and

an attentiveness to practices that mitigate disease dispersal. Here, preventing avian

influenza occurs even in the absence of potentially infectious birds, relying on individuals

to 'take action' and 'be prepared' in the potentially dangerous spaces of the hospital,

crowded public places, and other unclean environments. These simple practices and

accompanying consciousness support the underlying logic of pandemic preparedness,

which seeks to forestall disease outbreak through a coordination of state actions and

individual practices enacted within the everyday (Chapter One).

Though health advertisements differ in their specific content and presentation, they similarly portray idealized subjects that 'take action' by understanding and enacting messages conveyed by health officials. As seen, subjects who fail to do so, pose a danger

¹ This health advertisement can be viewed on the web at: <u>http://www.isd.gov.hk/eng/tvapi/05_md159.html</u> (accessed: March 6, 2008).

to themselves, others, and the state, and are subject to governmental control and fines. In effect, health advertisements set up symbolic boundaries between those who are prepared and those who are not, between prevention and danger, between health and disease, between sanitary subjects and unsanitary rogues (Douglas 2002).

How does the state form such dichotomies given the uncertainty engendered by the absence of widespread infection? Which aspects are unique to the preparedness project and which are rooted in interventions from the past?

In this chapter, I present a genealogy of sanitary subjects in Hong Kong, and by extension, their unsanitary counterparts, in order to contextualize current pandemic practices into a history of sanitation and disease control. To be sure, the sanitary lines being drawn today are arbitrary and an attention to their antecedents reveals their shifting nature. Writing on the history of tuberculosis control in Japan during the nineteenth and twentieth century, Johnston (1995) asserts that epidemics present both pathological and ideological events. Following Johnston, instead of presenting a straightforward account of the history of infectious diseases or healthcare in Hong Kong (for examples, see: Gauld and Gould 2002, Hutcheon 1999, Lee 1994, 1991, Philips 1988, Thong 1987), I chronicle the changing of ideas about disease to show how both pathology and disease epistemology have jointly affected the ways in which infectious diseases have been managed. I draw primarily on an extensive investigation of official documents, as found in the following sources: Hong Kong Blue Books (1844-1894), the Hong Kong Annual Reports (1894-1939 and 1946-2007), and the Hong Kong Gazetteer (1852-1940). These documents represent official state records of the year under review, each containing departmental year-end reviews, ordinances, and other insights into the on-goings of the

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colony. My historical examination concentrates on the general annual review, along with sections more directly related to public health and population. In reading how state actors chose to depict the year under review, I gain insight not only into specific events, ordinances, and attitudes, but I am also able to view the state on its own terms, through its own documentation of the year under review.

Recognizing that the writing of history is a flawed and subjective endeavor (Scott 1972), I divide Hong Kong's official state history, beginning from British colonial rule in 1842, into four general time periods: (1) the founding of the Colony to Osbert Chadwick's first visit (1842-1880), (2) the implementation of a 'new sanitation' leading up to the Second World War (1881-1940), (3) tremendous growth coupled with a rapid epidemiological transition (1945-1997), and finally, (4) the hand-over of the colony to the People's Republic of China, coinciding with the emergence H5N1, to the present (1997-2007). These divisions represent general time periods, as ideas, practices, and diseases certainly overlap and were carried over from one period to another. Important ideological and pathological events, however, serve to bound these time periods together.

1842-1880: Mal Aria, Filth, and the Foundation of HK's Sanitary Subjects

While the location of the Hong Kong made it a strategically advantageous site for British projects in Asia, with Victoria Harbor's natural depth serving as an attractive site for both naval and commercial ship docking, the environment and rampant health conditions of the new colony were less than appealing.² Hong Kong was filled with "sinks of decomposition and laboratories of poisonous gases" (Hong Kong 1849, 173), as

² Several twentieth century Annual Reports made mention to one particularly harsh review of the new colony: "In spite of the community's efforts *The Times* on December 17th, 1844 complained that 'The place has nothing to recommend it, if we except the excellent harbour. The site of the new town of Victoria— named after Queen Victoria the Good—is most objectionable, there being scarcely level ground enough for the requisite buildings, and the high hills, which overhang the locality, shut out the southerly winds, and render the place exceedingly hot, close, and unhealthy" (Hong Kong 1950, 106).

well as "reservoirs of filth" that produced air "so foul that it [would] not support combustion, an evidence of its deleterious qualities" (Hong Kong 1849, 177). The stench and *mal aria*, or 'bad air,' was sufficient to cause diseases of "the most infectious character" (Hong Kong 1856, 161), such as small-pox, dysentery, phthisis,³ a host of venereal diseases, and the disease that is now known as malaria.⁴ The colony became known for its insalubrious climate and fatal 'Hong Kong Fevers,' despite efforts to improve health and clean up the environment.⁵

Descriptions of 'filth,' 'foul odors,' 'decomposition' and Hong Kong's climate fill the Colonial Surgeons' reports, in line with the prevailing contemporaneous miasma theory of disease. In short, miasma theory holds that diseases are caused primarily by noxious gases that arise from decomposing material. The following statement by the Surgeon General elucidates this understanding:

Whatever renders the atmosphere impure, impairs the health, and predisposes the body to disease, and where numbers of sick are crowded together in close, dirty, and unventilated rooms, disease spreads with virulence, and malignity (Hong Kong 1854, 202).

Recognizing that climatic conditions were beyond the control of the state, improving the general health of the colony necessitated a purging of impure environmental elements through a concentration on improvements in "sewerage, drainage, ventilation, and cleanliness" (Hong Kong 1849, 173).

Descriptions of campaigns to improve the health of the colony played upon a racial binary between Europeans and 'Chinese,' with the former being the gold-standard

³ 'Phthisis' is an old disease nosology for what is now known as tuberculosis.

⁴ Malaria is caused by protozoan parasites of the *Plasmodium* genus, and is transmitted to humans via female *Anopheles* mosquitoes.

⁵ 'Hong Kong Fever' was a form of intermittent or remittent fever, which was later confirmed to be caused by *Plasmodium* parasites.

for sanitary subjects.⁶ This binary was largely played out in three ways. First, in connection to miasma theory, differing living conditions produced different disease environments. Though descriptions of European dwellings are mostly absent, they gain definition in contrast to detailed depictions of Chinese housing, which was "small, illventilated, undrained and thickly congregated" (Hong Kong 1849, 176), "faulty in construction, being erected apparently with the view of having the greatest number in the smallest possible space...without any regard to Ventilation and Drainage" (Hong Kong 1854, 202). Descriptions of Chinese housing filled the Colonial Surgeon's reports, along with other documents, and became symbolic of the colony's poor disease profile. Second, Europeans and Chinese were further distinguished by their everyday habits. Again, while descriptions of European habits did not make it into the colonial reports, they were made apparent in contrast to the Chinese habits.⁷ Reports did not document specific habits, yet their unhealthiness was implicit. For example, in 1849 the Colonial Surgeon stated: "[Chinese] are deficient in all the appliances of cleanliness. The social habits of the people, which it is difficult to control, add intensity to the external ends of their position" (Hong Kong 1849, 176). Finally, inherent racial differences between European and Chinese caused differential disease prevalence and symptoms.

All purely contagious diseases seems to change their peculiar characteristics in transmission from the Chinese and the Malay race to the European. This is the

⁶ The term 'Chinese' can be seen as a category of othering, as it encompassed a large array of non-European people. Malay traders and Indian Coolies were among the other groups lumped into this descriptions. 'Others' were variously referred to as 'Chinese,' 'native,' 'indigenous,' 'the poor,' and 'Orientals.'

⁷ Not all were of the opinion that Chinese habits were altogether unhealthy. In 1882, the Colonial Surgeon Report made a point to highlight the following quote from the 1881 Chadwick report: "Many experienced medical men who have practiced in China have recorded the opinion that typhoid fever is almost unknown there. It would appear that some have concluded from this that the filth and stinks with which the Chinese surround themselves are not only harmless, but even beneficial; that they have discovered the true art of living, and that they should be allowed to do in Hongkong as they do in the City of Kowloon and elsewhere in their own country" (Hong Kong 1883, 9).

case with the cow pox, the small pox, and the itch [i.e. scabies], which acquire in their transmission distinct and peculiar characteristics, and much intensity (Hong Kong 1849, 162).

Climate was seen as playing a significant role in why these innate differences were made apparent. While natives were naturally attuned to Hong Kong's heat and humidity, Europeans were not, causing them to suffer various ailments, as temperatures often reached "a point sufficiently elevated to be oppressive to most Europeans" (Hong Kong 1870, 140).

The Chinese further held different beliefs of disease etiology and customs for dealing with the sick. This system of beliefs can be broadly classified under the category of Chinese Traditional Medicine (CTM).^{8,9} As the colony expanded in terms of commercial appeal and size, gaining Kowloon in 1860 as a result of the Second Opium War (1856-1860) (see Figure 1), a steady stream of Chinese immigrants arrived, exacerbating existing health problems through incessant importation of disease, intensified overcrowding, and a refusal to follow colonial views of disease and sanitation. By the mid-1860s, Chinese elites, described by the reports as "the more substantial and intelligent members of the Native Community" (Hong Kong 1870, 275), began forming civil society groups to supply services not provided by the British to the expanding

⁸ Chinese Traditional Medicine (CTM) encompasses a broad range of practices and ideas that have differed throughout time and location. In the post-hand-over era, the Hong Kong-SAR government has made efforts to standardize practitioner training and treatment, in order to regulate this parallel medical system. This has brought CTM into a more standardized medical system and has further allowed for the testing of CTM practices, particularly through the use of large-scale clinical trials. The WHO has worked towards similar ends on a global scale (<u>http://www.wpro.who.int/publications/pub_9290611057.htm</u>; accessed: March 28, 2008). Anthropologist Judith Farquhar's (1994) work is a good resource for understanding this body of knowledge.

⁹ From initial reports, the subject of dying and death practices among the Chinese was of great interest to the Colonial state. For example: "The Chinese hold very solemn superstition relating to death. Their bodily relics are the property of their surviving friends, with whom it is a religious obligation to preserve and deposit them within the precincts of their feudal birthplace, consequently, with every man who is not indigenous to this Island, the first care in the event of sickness is to depart to his own country, that his ashes may be deposited there" (Hong Kong 1849, 167).

Chinese population. Services included police garrisons, refuse removal, and medical care (see Choa 2000, Benedict 1996). Discussions between the colonial government and Chinese elites led to the eventual opening of the Tung Wah Hospital in 1872, as a community run hospital subsidized by the government but primarily financed and managed by members of the Chinese community (Sinn 1989).

Sanitary subjects during this period were largely absent from colonial reports. In their place, unsanitary, racialized subjects were brought to the fore as examples requiring the attention of the colonial government. Their persistence in being unsanitary, by living in overcrowded housing, holding unhygienic habits and beliefs, and innate racial differences, allowed the colonial government to justify their attention to particular subjects. Chinese local elites counterbalanced the prevailing colonist view to provide more appropriate services, but did so by working within the colonial medical structure. While Western medicine at the time was not any more efficacious than traditional Chinese medicine (Benedict 1996), the management of disease highlights the differential power dynamics inherent in colonial rule.

1881-1940: Laboratories, Migrants, and the New Sanitation

In 1881, Osbert Chadwick, a British engineer, was sent to Hong Kong to investigate the sanitary conditions of the colony and make recommendations on how to ameliorate its long-standing health problems. Chadwick's visit and subsequent reports came at a pivotal time in the history of medicine: after years of decline, miasma theory was being supplanted by germ theory, as championed by the Pasteurians in France, Robert Koch in Germany, and John Snow and William Budd in England. Change was gradual, and miasma theory persisted in the colony well into the last decades of the nineteenth century, however, as demonstrated by the following ominous comment made by the Colonial Surgeon reviewing Chadwick's visit:

It is stated that hitherto Hongkong has escaped the epidemics which have affected other places in the neighbourhood. The settlement is but 40 years old, and the subsoil beneath the city may not yet be sufficiently saturated with filth to make it a hot bed for disease and a breeding ground of filth poison. It is somewhat premature to assume that this happy immunity will always continue for the process of saturation is slowly but surely going on, and if unchecked cannot fail to bring forth abundant fruit in the form of misery and disease (Hong Kong 1882, 145).

Unfortunately, the Colonial Surgeon's remarks were proven true with the first of a long series of bubonic plague epidemics that gripped the colony from 1894 to the mid-1920s (see Benedict 1996, Cunningham 1992). Although the colony had made several changes as a result of Chadwick's visit, governmental reports confess that Chadwick's recommendations were largely unheeded. Prolonged bubonic plague outbreaks forced the colonial government to recognize the problem and rapidly establish a system for dealing with disease, a system that was based on germ theory. Now, both Chinese and Europeans had to conform to the 'new sanitation,' which proved to be harder than expected.

In 1898, the colony greatly expanded in size with the lease of the New Territories, adding an additional 952 square kilometers of mountainous land occupied by scattered villages. Population concurrently increased due to a steady flow of immigrants from mainland China, many coming to the colony as a result of social unrest due to the decline of the Qing Dynasty (Figure 2). The opening of the Kowloon-Canton Railway (KCR) in 1911 allowed for greater trade possibilities with the surrounding areas; it also provided a new, faster way for entering the colony.¹⁰

¹⁰ Originally conceived in the late 1800s, the KCR became even more important with the lease on the New Territories and expanding trade with the nearby city of Guangzhou. Work on the railway began at the turn of the century and eventually opened in 1911. Facing massive transportation pressures as Hong Kong's



Figure 2 Hong Kong year-end population estimates (source: Hong Kong 1880-1941). The government acknowledged the difficulties in producing accurate estimates, and revised estimates when possible, as denoted by the second data points below the original estimates for the years 1912-1914 and 1922-1930.¹¹

The expansion of the territory and continual stream of Mainland immigrants

overburdened Hong Kong's transitioning health system, already unable to grapple with

major plague, smallpox, and malaria outbreaks. Imposing the new sanitation became a

problem of reaching a large and diverse group of people spread over a large and diverse

territory. One solution for doing so was through hygiene education. Hygiene education

population exploded in the 1950s and 60s, the KCR was renovated as a mostly above ground railway in the 1970s, connecting Kowloon and the growing development projects in the Eastern New Territories. During this time, Hong Kong also unveiled an underground metro system, the Massive Transit Railway (MTR), and eventually linked the MTR to the KCR in the 1980s. On December 2, 2007, the KCR was officially taken over by the private corporation running the MTC, MTR Corporation Limited.

¹¹ In 1880, the population was estimated at 160,402, growing to 400,660 by 1901, and surpassing the 1 million mark in 1937. Growing Sino-Japanese aggressions lead to large influxes of refugees throughout the latter half of the 1930s, and eventually caused the population to spike seen in 1940. In 1941, an unofficial census was carried out by the Air Raid Precautions wardens and the population was estimated to be 1,600,000, a loss of 200,000 from the estimated population of 1940 caused by people fleeing the colony and the encroaching Japanese army (Hong Kong 1946).

became a compulsory part of Hong Kong's curriculum in 1905, the first courses being based on a short government-published reader on hygiene (Hong Kong 1905). The courses quickly expanded to include specifics of disease transmission, such as "the mode of conveyance of the infection of Malaria by the mosquito and the manner in which the mosquito breeds," as such information became increasingly available through scientific research and discovery (Hong Kong 1909, K17). In addition to hygiene education, new hygienic practices were emerging: teams collected and disposed of refuse, public bathhouses were erected to promote corporeal cleanliness, and environments were changed to minimize disease incidence.¹² In this way, hygiene education was coupled with new measures that bolstered knowledge of disease based on germ theory.

By the turn of the twentieth century, sanitation was increasingly recognized as "one of the most important matters that can engage [the government's] attention" (Hong Kong 1898, 27). The new system sought an increased and refocused emphasis on sanitation fueled by experimentation and concentration on micro-level understandings of disease etiology (Cunningham 1992, Latour 1988). A series of laboratories were established that conducted experiments, generated (scientific) information, and produced materials with the aim of improving health and sanitation. Laboratories and research institutes in Hong Kong, such as the Colonial Veterinary Surgeon's Office (1890), the Bacteriology Department (1902), the Malariology Institute (1904), made significant contributions to the knowledge of infectious diseases, especially malaria, beri-beri, and

¹² Water sources were particularly important in this regard. Massive swamp draining campaigns sought to rid mosquito breeding grounds, and thus minimize the risk of malaria infection. Widespread stream training efforts, an active measure to change the course of water flow, sought to move water sources further away from residential areas for the same reason.

plague.¹³ This system of knowledge production fueled new health measures. For example, vaccines became a fundamental element of health in the colony. Soon after the widespread adoption of vaccination in Europe (Latour 1988), the colony passed the Vaccine Ordinance of 1888, which aimed to vaccinate all newborns against small-pox.¹⁴ While initially calf-lymph for the vaccines was imported from England, America, Japan, and Australia (Hong Kong 1891), the colony quickly realized the utility of having locally produced vaccines, particularly given the desire to increase vaccination among the general population. The Hong Kong Vaccine Institute was inaugurated in 1892, and vaccines were increasingly routinized through intensified vaccine production and ordinances that widened vaccination campaigns.

Knowledge and materials produced in laboratories spurred on massive sanitation activities. In turn, sanitation activities uncovered new materials for laboratories to work on, creating a reciprocal relationship where both laboratories and sanitation activities gained justification for their existence through continual, mutual validation. Plague research and public health campaigns serve to illuminate this point. In 1901, Chadwick returned to the colony with Dr. W.J. Simpson to make further assessment of conditions encouraging infectious disease outbreaks, and in particular, plague. In his concluding report, Chadwick noted that conditions were "generally, rather worse than better, than they were in 1882" (Chadwick 1903). Although conditions might have deteriorated, the

¹³ It was in Hong Kong that the plague causing bacillus was first isolated by Dr. Kitasato and Alexandre Yersin in 1894. The plague-causing bacillus, *Yersinia pestis*, is named after Yersin.

¹⁴ Writing in 1909, Francis Clark, the Colonial Medical Officer of Health, described the process of vaccination as follows: "Vaccination is usually performed by making three of four very small scratches on the muscular part of the upper arm and applying the vaccine to the scratches. In the case of re-vaccination this will produce a small pimple on the second or third day which then becomes a small blister, while on the seventh or eighth day there will be a scab or crust. There will be a small amount of itching for the first two or three days, and the child must take car not to knock the arm roughly, but there will be no ill-health, the child will be able to take its meals as usual and will be able to run about and play, so long as it does not join in rough games with its school fellows" (Hong Kong 1909, K36).

colony had changed: medical infrastructure had greatly expanded, there was an increase in medical personnel, and most importantly, the colony authorities had the will to undertake Chadwick and Simpson's recommendations. One of the most important results of their visit was the Housing Ordinances of 1902 and 1903, which targeted Hong Kong's poor housing conditions by setting out specific regulations on overcrowding, ventilation, refuse collection, and a variety of other regulations that intended to diminish disease occurrence. Another result of Chadwick and Simpson's visit was massive 'rat proofing' campaigns: buildings were lime-washed, special brigades were dispatched to exterminate rats, and disposal stations were set up throughout the colony to collect rats. Rats were brought to the Plague Institute in large numbers for examination, compiling information of the incidence of the plague-causing bacillus and fueling more rat proofing campaigns. Campaigns, in turn, resulted in the collection of more rats that would be examined and surveyed. Plague research and sanitation campaigns in Hong Kong exemplify Bruno Latour's (1988) analysis of the production of scientific knowledge, which, he posits, relies on a broad range of interconnected actors working in unison to vindicate their shared existence and purpose.

After a twenty year period of increased emphasis on sanitation, relative Sanitation Department expenditure decreased dramatically in the early 1920s, as reflected in a comparison of the Sanitation and Medical Departmental expenditures (Figure 3). By 1924, Medical Expenditure was once again greater than Sanitation Expenditure, coinciding with the first year that Hong Kong had been declared "entirely free" from plague since the initial outbreak in 1894 (Hong Kong 1925, M46). At approximately the same time, lists of 'sanitation nuisances' began to appear in a new section of the *Medical Report*. Lists of

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Figure 3 Ratio between Medical and Sanitation Departmental Expenditure (source Hong Kong 1889-1940). As a ratio, the value '1' represents equal medical and sanitation spending, whereas data points below '1' represent more spending on medical and data points above '1' represent more spending on sanitation.

nuisances included the following among others: 'dirty conditions of premises,' 'accumulation of refuse,' 'obstruction of light and ventilation,' 'overcrowding,' and 'offensive trade (rag storing, boiling, etc.)' (Hong Kong 1920, M34). A list of sanitation nuisances suggests that people had been, or at least should have been, aware that their actions were unsanitary, pointing to education as a formative tool in changing sanitation awareness. I argue that the waning of sanitation in Hong Kong, as denoted by the decrease in relative Sanitation Expenditure coupled with an increased emphasis of nuisance notifications and hygiene education, as a displacement of state responsibility onto individuals (Foucault 1988). The sanitary subject had to be knowledgeable of how to take care of themselves, through assuming hygienic practices meant to minimize disease or risk being fined as unsanitary delinquents. I posit that the mechanisms for displacing sanitary responsibility onto the individual relied on the establishment of infrastructure and the production of knowledge, which lead to an eventual emphasis on curative medicine.

1945-1997: The People Problem, Globalization, and the Epidemiological Transition

The World War II Japanese Occupation of Hong Kong lasted almost "3 Years and

8 Months," and British sovereignty over the area was reinstated on August 15, 1945 with

the surrender of the Japanese troops.¹⁵ In the years following the Japanese withdrawal,

Guomingdang Nationalist and Chinese Communist fighting resumed on the mainland,

catalyzing a massive wave of new migrants into the colony. From 1945 to 1950, the

population grew from an estimated 600,000 to more than 2.2 million people (Figure 4).

Squatter communities sprung up throughout the territory and as before, newcomers

brought with them a host of diseases and lack of understanding of the colony's sanitation

practices, especially in terms of housing.

The influx of Chinese into Hong Kong, which still continues, is a matter of some concern as it has caused serious over-crowding. Large squatter settlements have mushroomed all over the Colony. The flimsy and insanitary structures in which they dwell constitute a serious menace to health (Hong Kong 1949, 2).

With the founding of the People's Republic of China (PRC) by the Communist Party on October 1, 1949, the Hong Kong-Mainland border was officially closed, although migrants continued to sneak into the territory for some time.¹⁶ Global discontent with the founding of Communist China led to the May 18, 1951 Resolution of the General

¹⁵The Japanese occupation of Hong Kong was explained in the first annual review after WWII in 1946 as follows: "After almost exactly 100 years of British rule the Colony was captured by Japanese forces on Christmas Day, 1941, and remained in Japanese hands until August, 1945. The Japanese regime came to an end rather gradually since Japan's defeat was virtually accepted by the local Japanese authorities some fourteen days before Allied forces were able to reach the Colony... On 30th August, 1945, units of the British Pacific Fleet... re-entered the waters of the Colony. The enemy forces were made prisoner and a military administration was set up" (Hong Kong 1946, 1).

¹⁶ The British formally recognized the founding of the PRC on February 6, 1950 (Hong Kong 1951, 9). Though officially closed in 1951, the border was not fully closed until 1953 (Hong Kong 1954, 12).





Assembly of the United Nation for "all member countries to impose an embargo on the shipment of strategic goods to China" (Hong Kong 1951, 8), affecting Hong Kong's economy both directly, as China was its largest trading partner, and indirectly, as concern grew that perhaps it too would succumb to Communism.¹⁷ In the aftermath of the Japanese occupation, Hong Kong scrambled to reinvent itself as a more global economic center, distinct and disconnected from its red neighbor, while being burdened with large-scale reconstruction and a greatly enlarged population.

"The Problem of People," as it was referred to in reports, greatly encumbered the colony for decades to come (Hong Kong 1956b.). After a series of devastating fires in squatter communities in late 1940s and 1950s, the government was forced to recognize that, unlike before, migrants could not return to their natal cities and villages and that

¹⁷ The Colony was angered by this conflation: "The United States Government clearly considered that the colonies of Hong Kong and Macao might prove to be weak links in the economic chain they intended to throw around the China coast and accordingly included them in the effective area of the embargo" (Hong Kong 1951, 8)

solving the problem of people would necessitate long-term solutions, as explained here:

The Hong Kong Government has a very special responsibility [to its people]... The essential problem is not one of relief. It is a question of rehabilitation in such a way that the people concerned can be absorbed into the economic life of the basic community. It is a matter of building... houses in areas where industry can absorb the occupants and of stimulating and assisting industry so that it is in a position to increase employment (Hong Kong 1953, 12).

The colonial government embarked on a variety of major infrastructure projects: new residential and industrial centers were founded in the largely unsettled New Territories,¹⁸ multi-storey public housing blocks were designed to be "sanitary, weather-proof and fire-proof" while accommodating the maximum number of people (Hong Kong 1956, 25), and a comprehensive transportation system was laid down, connecting far-flung residences, work places, and commercial areas.

Clinics and hospitals were also a pressing need, as "the new communities themselves provide[d] a most fertile ground for epidemic diseases" (Hong Kong 1956, 30). Developments in medicine during the 1930s and 40s, namely the discovery of penicillin by Sir Alexander Fleming in 1928 and the proliferation of vaccines, allowed for the continued and increased emphasis on the administration of medicine as the core of health management.^{19,20} Intensive vaccination propaganda improved the public's compliance to levels previously unachieved.²¹ Reports further demonstrate the increased

¹⁸ Hong Kong's economic success was largely attributed to rapid industrialization during this period: "This has been achieved by a very remarkable expansion of the manufacturing industry" (Hong Kong 1954, 8). The first chapter of the 1958 Annual Review provides an overview of Hong Kong's industrialization and economic development.

 ¹⁹ Sir Alexander Fleming famously discovered penicillin by accident in 1928 while working on staphylococci samples. Penicillin and other antibiotics became widely available during the 1930's.
²⁰ The following is a list of major vaccination campaigns during this time: BCG in 1951; Typhoid Fever

^{1953;} Diptheria 1954; Polio 1963; Measles 1967; TB 1969 with the use of an x-ray machine.

²¹The following quote illuminates this point, in reference to a UNICEF-led BCG vaccination campaign: "In the first quarter of the year a vigorous immunization campaign was launched, following intensive propaganda. The response was unexpectedly good, so good that at times the supply organization was embarrassed having planned the arrival of the vaccine in the Colony on the basis of past experience" (Hong

globalization of medicines: the WHO, founded in 1947, established global surveillance systems and health guidelines (Hong Kong 1957, 166), international organizations, such as United Nations International Children's Emergency Fund (UNICEF), provided money for vaccination campaigns (Hong Kong 1951, 12), and growing regional communication and partnerships helped to shape healthcare in Hong Kong. While a focus on the administration of medicine and global influences were certainly not new, the intensification of both was a poignant dimension to healthcare during this period.

Post-War Hong Kong was also marked by increased public involvement. In July 1947, a new constitution known as the 'Young Plan,' was approved that sought to grant "the people of the Colony a fuller and more responsible share in the management of their own affairs" (Hong Kong 1947, 2). The implementation of ideals and practices of participatory democracy, however, remained a contentious issue in Hong Kong, as evidenced by major strikes and riots in the 1940s, 50s and 60s.²² Civil groups once again stepped in to provide public services that were otherwise lacking or deficient. In addition to the Tung Wah Group of Chinese Hospitals, Kaifong Welfare Associations (街坊福利 會) grew in number, scale, and effectiveness (Osgood 1975). Led entirely by the Chinese community, Kaifong Welfare Associations aimed to "promote the welfare and general social improvement of all genuine residents in their districts" (Hong Kong 1950, 11), offering an extensive array of services, such as free schools, recreational facilities, and medical care (Hong Kong 1950, 62). Private interest groups also made large donations to benefit the health of the colony. For example, in 1959 the Hong Kong Jockey Club

Kong 1953, 94).

²² Indeed, it remains so, as made evident by the recent debates on further deferment of universal suffrage in the Special Autonomous Region.

constructed \$8,025,000-worth of buildings to be maintained by the Medical and Health Department (Hong Kong 1959, 131). While the government grappled with the problem of people, the people of Hong Kong continued to form civil groups to promote community health and well-being.

Although infectious diseases, and in particular tuberculosis, remained severe health problems into the 1970s, ²³ Hong Kong rapidly underwent an epidemiological transition: a transition from a society marked primarily by infectious diseases and high fertility, morbidity, and mortality rates to a society characterized by longer lifeexpectancies, lower fertility rates, overall improved health conditions, and chronic diseases (Omran 1977, 1971). Health authorities began to notice this shift in 1960:

Significant changes have occurred in the pattern of mortality during the last ten years, changes which reflect the presumed age structure of the population and improvements in medical and health measures. Deaths from infectious diseases... have shown a marked decline. On the other hand...[there has been a] gradual rise in deaths from the diseases of the later years of life, notably cancer and disease of the heart, blood vessels and brain (Hong Kong 1961, 125)

Occurring largely between 1950 and the late 1970s (Philips 1988, 11), Hong Kong's epidemiological transition was greatly aided by social, welfare, and educational services.^{24,25} Hygiene education expanded through more detailed school programs and widespread societal campaigns. In 1959, an inter-departmental committee on health education was formed with the aim of more firmly instilling the "principles of preventive

²³ A WHO investigation on the global prevalence of tuberculosis found that "the chances of infection in Hong Kong, with a high death rate at an early age, are greater than in any other country covered by the report" (Hong Kong 1956, 131).

²⁴ David Philips (1988) and Lee Shiu-Hung (1994, 1991) have separately utilized governmental records to analyze Hong Kong's epidemiological transition.

²⁵ Philip posits that seven broad factors were the main contributors to the epidemiological transition in Hong Kong: 1) Greatly improved disease environment, 2) Governmental investment in health care, and the subvention, private and charitable institutions, 3) Good economy, 4) Accommodation has greatly improved, 5) Changes to societal attitudes, particularly in terms of aspirations and life styles, 6) Dietary changes, and 7) Investment in social, welfare, and educational services (Philips 1988, 80-81).

medicine and environmental hygiene" in health messages (Hong Kong 1960, 126). Such health campaigns built momentum immediately following WWII. For example, in 1946, the Hong Kong Anti-Tuberculosis Association launched a publicity campaign to reduce indiscriminate spitting and encourage the early reporting of cases (Hong Kong 1946, 64). In 1957, a governmental investigation was conducted into the sanitation of street hawkers and thereafter various methods were taken to control and curtail hawkers throughout Hong Kong (Hong Kong 1959, 160-161). Anti-smoking campaigns beginning in the 1970s intensified in 1980 in recognition of the WHO's Anti-Smoking Year. The epidemiological transition in Hong Kong was seemingly paralleled by shifts in campaign themes that focused on how an unhygienic environment and unsanitary behaviors, like spitting, eating at unclean places, and smoking, could impact health not only in the present but also in the future.

In 1972, the government launched an ambitious campaign entitled 'Keep Hong Kong Clean.' The project was "the first major attempt to mobilize a full-scale community effort, concentrated on a particular problem" (Hong Kong 1973, 8). Bolstered by stricter penalties for litter offences, the campaign sought to improve the colony's environmental hygiene while building up a sense of community. At the center of the campaign was *Lap Sap Chung* (垃圾虫, 'litterbug'), a littering dragon-like character who was described as "Hong Kong's number-one public enemy" (Hong Kong 1972, 4).²⁶ Over a decade earlier, the government had created Miss Ping On (平安小姐, known in English as 'Miss Super Clean'), a character featured in a long string of campaigns who epitomized proper sanitation and educated the public on matters of sanitation under such themes as "Your

²⁶ For an governmental overview of the 'Keep Hong Kong Clean' campaign, see <u>http://www.fehd.gov.hk/pleasant_environment/chk/70.html</u> (accessed: March 22, 2008).

Food and You', 'Home Safety', 'Correct Disposal of Refuse', and 'Destruction of Insects and Vermin'" (Hong Kong 1960, 145-146).²⁷ Juxtaposing Miss Ping On with *Lap Sap Chung* brings into relief the image of sanitary subjects and their counterparts during this period. Sanitary subjects were people who not only understood infectious disease etiology and could modify their behaviors accordingly, but also increasingly expected to understand their behaviors in terms of the larger Hong Kong community and its future. Disease was no longer a private misfortune, but was increasingly an offense to public order.

1997-Present: From Hand-Over to Pandemic Preparedness

After 156 years of colonialism and more than 15 years of negotiations, Hong Kong was handed-over to Mainland China on July 1, 1997. The territory was no longer known as a fledgling, disease-ridden colony. Hong Kong was recognized as a global economic center, with a GNP of over \$1.33 trillion dollars and the governmental revenue for the year was over \$281 billion dollars (Hong Kong 1999). Hong Kong's health indices were similar, if not better, than most developed countries: the infant morality rate had dropped to four per 1000 live births, the crude birth rate was 9.1 per thousand, the maternal mortality rate was 1.6 per thousand, and average life expectancy at birth for men was over 76 years and almost 82 for women (Hong Kong 1998, 155). Hong Kong had a total of 9,496 registered doctors and 30,799 beds distributed in public and private hospitals to serve a population of 6.62 million, statistics similar to most developed urban areas in the world. At the time, health problems were described as "mostly due to lifestyle-related chronic degenerative diseases" (Hong Kong 1998, 155), and had been

²⁷ Images of Miss Ping On campaign posters can be viewed on the Hong Kong government website: <u>http://www.fehd.gov.hk/pleasant_environment/chk/40.html</u> (accessed: March 26, 2008).

described as such for much of the past twenty years.²⁸

It was within this context that the first human case of H5N1 was detected in Hong Kong in a three-year-old boy in May 1997. Subsequent cases in November and December of that year instigated a series of stringent controls that saw the mass culling of all of Hong Kong's 1.5 million chickens and a further seven-week ban on poultry imports (Bridges et al. 2000). The reemergence of human cases of H5N1 in 2003 coincided with the emergence of Severe Acute Respiratory Syndrome (SARS), a pneumonia-causing coronavirus that was initially thought to be avian influenza (Murray 2006). In the months immediately following SARS, the Hong Kong Department of Health formed the SARS Expert Committee to review and evaluate events prior to and during the outbreak.²⁹ The Committee was composed of seven overseas, two Mainland, and two local professionals and experts, and resulted in a 279-page report entitled SARS in Hong Kong: From *Experience to Action* (Sars Expert Committee 2003).³⁰ In the accompanying letter to the Chief Executive upon the submission of the report on October 2, 2003, the Committee Co-Chairs made it clear that although they did not deem any individual "to be culpable of negligence, lack of diligence or maladministration in the handling of the SARS epidemic," the primary reason for the report was to "make recommendations on what should be done urgently, and what should be done in the longer term" (Ibid, 2).³¹

The underlying message of the Committee was explicit: "lessons must be learnt" (SARS Expert Committee 2003, 2). As discussed briefly in Chapter One, due to the prolonged absence of widespread disease, history provides pandemic preparedness with a

²⁸ In 1997, the four leading causes of death were cancers (32%), heart diseases (15%), pneumonia (12%), and cerebrovascular disease (10 %) (Hong Kong 1998).

²⁹ The SARS Expert Committee website: <u>http://www.sars-expertcom.gov.hk/</u> (accessed: March 30, 2008)

³⁰ <u>http://www.sars-expertcom.gov.hk/english/reports/reports/reports_fullrpt.html</u> (accessed: March 30, 2008)

³¹ http://www.sars-expertcom.gov.hk/english/reports/files/e_letter.pdf (accessed: March 30, 2008)

powerful raison d'être: in order to avoid the large-scale negative effects of disease

epidemics, the state and its subjects must take on these precautionary measures, lest

history repeat itself.

History Repeating

Through this reading of Hong Kong's history of infectious disease management,

the television health advertisement presented at the beginning of this chapter can now be

viewed in a different light.

Voice Over: To prevent avian flu, you should wash hands frequently, maintain a clean environment, and ensure good ventilation. Cover mouth and nose with tissue paper when coughing or sneezing and dispose of soiled tissue paper properly in a lidded rubbish bin, then wash hands immediately. People with flu symptoms, caregivers of patients, and visitors of hospitals or clinics should wear a mask. And, avoid crowded places.

A group of four adults surrounding a male doctor with a young boy in the foreground (together): Take action now!

Voice Over: Be prepared. Act now to prevent influenza.

The sanitary subjects in this advertisement arise from a symbolic boundary that separates

them from unsanitary nuisances, such as the woman detained at the border with a bag full

of poultry (Chapter One). Such symbolic boundaries inform the ideas and practices used

by the state to manage health and control disease. While state discourse reifies a fixed

boundary, as I have shown here, the boundary between the sanitary and the unsanitary is

a shifting one, affirmed, contested, and moved by both changes to disease epistemology

and pathological realities.

Chapter Three: Beyond the Everyday

In early September 2007, a major H5N1 outbreak among waterfowl occurred in a village located on the Pearl River, some 200 kilometers from Hong Kong in the outlying Guangzhou district of Panyu (番禺). Although no human infections were reported, the outbreak killed an estimated 9,830 ducks and geese over the course of eight days (*South China Morning Post*, September 17, 2007). Infected birds were confirmed to have been inoculated against influenza, as stipulated by Guangdong provincial regulations, causing speculation as to why vaccines had failed to prevent an outbreak. Health authorities promptly reacted by quarantining the area, conducting province-wide re-vaccination efforts, immediately culling some 32,600 ducks that had been in contact with dead birds, and culling an additional 100,000 birds in order to prevent the virus from spreading (*South China Morning Post*, September 18, 2007).

Hong Kong had already taken measures to diminish the risk of an H5N1 outbreak among waterfowl. After the virus killed more than 30 ducks and geese in December 2002, waterfowl rearing in Hong Kong was replaced with centralized slaughterhouses and the importation of only chilled and frozen duck and geese products. These two measures aimed to reduce the likelihood that H5N1 could arise in Hong Kong's waterfowl populations, seen as more susceptible disease reservoirs through their closer contact with the environment. Despite these precautions, the H5N1 outbreak in Panyu was deemed by the Hong Kong government to require additional state measures to minimize the risk of disease importation. Upon laboratory confirmation of H5N1 on September 17th, the Hong Kong Ministry of Agriculture imposed a one-week ban on the importation of all duck and geese products originating from Guangdong Province and a three-week ban on all poultry products from farms within a 24-kilometer radius of Panyu.¹ In addition, the Ministry cancelled a previous arrangement that would have increased live chicken imports from the Mainland for the Mid-Autumn Festival, that year on September 25th, and the October 1st PRC National Day celebrations. The cancellation amounted to a loss of approximately 240 thousand chickens.²

The outbreak of H5N1 in Panyu was followed closely by both the Chinese and English media in Hong Kong. Reports primarily conveyed information released by the Hong Kong Health Authority, adding little beyond short quotes taken from interviews with local health experts. ³ Headlines demonstrate this point: "Little chance of Panyu duck microbes entering Hong Kong" (*Pingguo Ribao*, September 16, 2007), "Officials confident quick action will stop bird flu outbreak from spreading" (*South China Morning Post*, September 18, 2007), and "Experts say possibility is remote that H5N1 virus killing mainland ducks is a new strain" (*South China Morning Post*, September 19, 2007). Experts emphasized that while the source of infection remained unclear, the virus had not mutated, a shift that could have signaled a change in the virus' pathogenicity and its ability to infect and transmit between humans.

While experts advised the public "not to be scared of avian influenza and not to cut down on eating duck and geese products" (*Pingguo Ribao*, September 16, 2007, see also *South China Morning Post*, September 19, 2007), the public, in contrast, was seemingly more anxious about food availability and not food safety. The temporary ban

¹ This affected a reported 20 farms (<u>http://www.info.gov.hk/gia/general/200709/17/P200709170270.htm;</u> accessed: April 14, 2008).

² <u>http://www.info.gov.hk/gia/general/200709/17/P200709170270.htm</u> (accessed: April 14, 2008

³ Government press releases concerning the Panyu H5N1 outbreak can be found on the following website: <u>http://www.info.gov.hk/info/flu/eng/news2007.htm</u> (accessed: April 14, 2008).

on duck, geese, and poultry imports would limit key food items during a time when cuisine and feasting were integral to celebration (Liu 2008, Farquhar 2002), raising concerns that "without ducks and geese... the demand for chicken will surely skyrocket" (*Pingguo Ribao*, September 18, 2007). The price of chicken quickly rose by 35% to 40 Hong Kong dollars per kilogram, the highest price for poultry during Mid-Autumn Festival since 2002 (*Pingguo Ribao*, September 18, 2007).⁴

The juxtaposition of expert and lay concerns in media reports covering the Panyu H5N1 outbreak point to a subtle yet distinguishable friction within the pandemic preparedness project. Using the logic of pandemic preparedness, health experts implemented a ban on poultry and other potentially dangerous products that aimed to diminish the risk of an avian influenza outbreak in Hong Kong, producing an even stricter *cordon sanitaire* guarding against the importation disease from a nearby area. The public is meant to understand this logic and the infringement on existing cultural practices that its enactment entails. Although the public had no recourse for changing these austere preparedness practices, concerns about food availability form a rebuttal to expert knowledge and state preparedness practices, raising a potent question: When preparedness goes beyond the everyday, where are its limits?

⁴ In the months preceding the outbreak, pork and beef prices had escalated rapidly in Hong Kong due to a number of factors that limited the importation of both into the territory (see *South China Morning Post*, August 22, 2007 and *South China Morning Post*, August 25, 2007). Thus, the ban on poultry came at a time when public concern for inflated prices of staple meats was already heightened.

Chapter Four: On Behalf of the State

Media reports covering the H5N1 outbreak in Panyu reify a dichotomy between the state and public. Health experts are positioned on the side of the state and stand in contrast to the public at large who await news and instructions. My discussion of avian influenza pandemic preparedness in Hong Kong has similarly relied on a division between the state and public: in emphasizing state discourse and practice, I have treated the state and its actors as one and the same. The state appears as a singular agent composed of a diversity of state actors, acting uniformly in what is an assuredly topdown, state-driven project.

In speaking with health experts, both formally and informally, it was apparent that how they viewed and enacted pandemic preparedness was not always aligned with official state discourse. In total, I interviewed nine people working on avian influenza pandemic preparedness in Hong Kong during the summer of 2007. The people I interviewed differed in terms of their profession and the extent of their involvement in pandemic preparedness. They worked in a variety of settings, from public hospitals, to governmental offices, to academic institutions. They varied in sex, age, and background, although all were highly educated and over thirty years of age, and most were male. No one I spoke to worked exclusively on avian influenza pandemic preparedness. It is thus difficult to categorize the people who I interviewed. What they had in common was that some part of their work was linked to state measures to avoid an avian influenza outbreak, whether it be through laboratory research, the treatment of patients, or the drafting of regulations and protocols. While all but one were natives of Hong Kong, everyone spoke English fluently, most having spent time abroad for work or training. Acknowledging the diversity of the people I interviewed, I term this diverse cohort of people 'state healthcare actors.'

Most broadly, I situate my examination of interviews within the literature on risk perception. This body of literature encompasses works that span several disciplines, without a uniform research paradigm, set of methodologies, or focused investigative area of inquiry (Wynne 1995). Work on risk perception has generally targeted the disjuncture between scientific knowledge and lay knowledge and practices (Ibid). Along this yein, recent studies have utilized surveys to assess avian influenza knowledge, understandings, and risk perception among poultry farmers in Italy (Abbate et al. 2006), the population at large in several European and Asian countries (de Zwart et al. 2007), and Hong Kong's population more specifically (Fielding et al. 2005). Investigations on how the producers of scientific knowledge understand and relate to scientific information form another area of risk perception studies (Wynne 1995; e.g., Fortun and Fortun 2005, Gifford 1986). I position my examination of interviews with state healthcare actors within this latter area of research in combination with an overarching concern for how individuals understand and engage with uncertainty (Introduction). I divide my discussion of interviews into three sections. The first section examines how state healthcare actors view the pandemic preparedness project in Hong Kong and elsewhere. The second examines how these actors understand the uncertainty that underlies pandemic preparedness. And the third section examines state healthcare actors' experience with infectious disease outbreaks and their personal preparedness practices.

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Preparedness Revisited

The people I interviewed were overwhelmingly confident about preparedness practices in Hong Kong. Most made mention that Hong Kong was one of the most, if not the most, prepared places in the world. For example, a risk communication specialist at Hong Kong University stated: "Hong Kong actually is one of the best prepared societies in the world, in terms of preparedness in a medical, biomedical sense as well as in a social sense." On the state level, people affirmed their conviction in state pandemic preparedness practices. Measures had proven their efficacy through practice drills that tested preparedness plans, which were described as "well worked out" and "successful," and the control of periodic outbreaks of diseases of low-pathogenicity, such as annual influenza and norovirus.¹ The most significant piece of evidence that validated state preparedness practices was Hong Kong's lack of avian influenza cases, which was mentioned by one state healthcare actor to unequivocally testify "that the measures being introduced throughout the years have been effective at keeping H5 at bay." On a societal level, while some state healthcare actors had doubts about people's compliance with preparedness practices, everyone spoke of the public's high degree of awareness and ability to respond quickly in times of crisis. One person stated:

I think that Hong Kong people can react quite fast. They do have a sense of what is the right thing to do. For example, we have some news that the pandemic is coming, then probably the can be reactivated to this alert level quite easily.

Statements about the public's level of preparedness acknowledged a pervasive awareness and understanding of preparedness messages, particularly in terms of personal hygiene. State healthcare actors viewed the public's knowledge as beneficial for facilitating rapid

¹ Norovirus is a RNA virus that causes most cases of the non-bacteria induced gastroenteritis.

responses during a future pandemic, making it easier for health authorities to convey information and control disease outbreaks.

Descriptions of preparedness in Hong Kong were contrasted with preparedness in other countries, especially countries in Asia that had reported human cases of H5N1. Indonesia and Vietnam, the countries with the most confirmed cases of human H5N1 infection, were highlighted as countries in need of improved preparedness standards.² When asked about preparedness in China, most state healthcare actors mentioned that although Hong Kong was at risk of importing avian influenza from the Mainland, they recognized that health authorities across the border were making efforts to strengthen preparedness. State healthcare actors commended the Mainland for investing more resources into preparedness and increasing its transparency in the reporting of cases. Despite improvements, uncertainties remained, not all of which could be diminished through state action. One person stated that it would be "unrealistic to expect the whole of China to be at the same sophisticated stage as Hong Kong" because of its large population and expansive rural areas posed an immense challenge to disease detection. Hong Kong, on the other hand, he said, was a small, wealthy society, where "immediately, if a bird dies... there is somebody that will report it." Working relations fostered with regional health authorities in the Mainland were seen as a means for bypassing some of the risks Hong Kong faced being proximal to China, through securing quicker access to information and establishing more reliable collaborations.

² Indonesia and Vietnam are the only two countries to have more than 100 confirmed cases of Human H5N1 infection. Since 2003, Vietnam has had 106 cases leading to 52 deaths and Indonesia has had 137 cases leading to 112 deaths (<u>http://www.who.int/csr/disease/avian_influenza/en/;</u> accessed October 7, 2008).

Deficient preparedness in places outside of Hong Kong was largely explained by the availability of financial resources: in the absence of cases of H5N1, devoting resources on a future pandemic necessitates compromising resources allocated for current health challenges. While wealthy societies could afford funding both current and future health risks concurrently, preparedness presented major obstacles for countries that lacked sufficient resources. A risk communication specialist explained it to me as follows:

[Treating current health challenges is] probably more important than preparing for a hypothetical pandemic... It's really societies that need to balance the different costs and benefits in understanding what needs to be done... Take a country like Indonesia for example. Now if it were to build up huge stocks of *Tamiflu* that would take away from programs to control malaria, dengue or another disease.

In this way, pandemic preparedness was recognized as a pragmatic balancing of current and future risks that necessitate governmental financial support. State healthcare actors acknowledged that Hong Kong's high level of preparedness stemmed in part from a privileged economic position and proper financial backing.

The history of previous influenza pandemics played a significant role in how state healthcare actors conveyed the need to be prepared in Hong Kong and for understanding what a future pandemic might be like. A virologist stated: "[The public] may expect the situation not to be so bad, but we know a pandemic is a catastrophic event. It is as worse as any public health event you can get." Taking from the influenza pandemics of the past, while some places are seen as more risky than others, if H5N1 does gain the ability to transmit efficiently between humans and becomes a pandemic, space becomes irrelevant as a pandemic will constitutes a global phenomenon. Measures to protect space, such as preparedness practices enacted at borders (Chapter One), might serve in forestalling a
pandemic but would not be able to stop a pandemic from occurring in Hong Kong. During a pandemic, risk was described as being individualized and not localized. A virologist explained that during a pandemic the risk of being infected "would not be so much about where you live, but on the risk profile of the kind of people the virus seems to be affecting the most." He added: "It's really a relationship between... you and the virus."

In contextualizing current preparedness efforts into a history of practices used to deal with influenza, the uniqueness of avian influenza pandemic preparedness that pervades state discourse seemed to be shaken. While technologies for disease surveillance, testing, and the production of medication may be new, the practices for targeting influenza, such as the stockpiling of antiviral medication, establishment of surveillance networks, planned rapid interventions, and attention to basic hygiene as a means for reducing disease transmission, are decidedly not (Chapter Two). The true novelty of avian influenza pandemic preparedness, as described by several of the people I interviewed, lies within a shift in the recognition of and emphasis on particular risks. A risk communication specialist described it as follows:

It's a bit like climate change or global warming, something we've known for decades. But it's only recently that society has decided that we are willing to look at it. Not only willing to look at it, do something about it, it is a risk we are willing to consider.

Acknowledging the risk of an influenza pandemic, he explained, is the focusing on a particular risk out of "hundreds of other risks," some of which may not even be known.

Beyond the influenza pandemics of the past century, the 2003 SARS epidemic in Hong Kong was a salient catalyst for recognizing impending risks and converting this recognition into a need to be prepared. State healthcare actors often used SARS as a temporal reference, describing attitudes and practices as pre- and post-SARS. For example, in describing hospital preparedness practices, a hospital director stated. "Before SARS it was not like that. But since SARS we have sort of learned our lesson and … have stepped up a lot in terms of preparedness." While everyone described the SARS epidemic in the negative as "painful," "a social crisis," "a bad hit" that "took everyone by surprise," and simply as "frightening," the undercurrent of such descriptions was that SARS was a positive "opportunity to enact [preparedness] systems."

Hong Kong's experience with SARS also provided the powerful justification for pandemic preparedness. Even in its nascent stages, preparedness measures that targeted avian influenza detected SARS early on and helped prevent it from causing more widespread damage. One state healthcare actor explained:

[When] SARS broke out, everybody thought that it was influenza at first because that is what they were looking for. And the [health authorities] caught it because they were looking for influenza. They detected this human disease, this unknown respiratory disease because they were looking for influenza.

Having successfully detected and controlled the outbreak, the experience with SARS offered crucial 'lessons' that had to be learnt in order to avoid future, more pathogenic outbreaks, such as avian influenza. The Centre for Health Protection Infectious Disease Controller commented: "We went through SARS. It might be a little overture for the real thing." In learning the lessons of SARS and focusing on the risk of avian influenza through an emphasis on pandemic preparedness, positive changes to healthcare in Hong Kong have taken place and a "highly alert state has become the new norm" (Chapter One).

Engaging the Uncertain with Imperfect Knowledge

Although no one questioned the need to be prepared, issues of uncertainty

pervaded interviews on pandemic preparedness. The following quotes by different state

healthcare actors explicitly reference uncertainty as a central part of pandemic

preparedness.

How do we deal with all of these uncertainties is basically the central question.

How do you tell people about a catastrophe or a crisis that you know is likely, but you don't know how likely? You believe this is going to happen, but you don't know when it's going to happen.

Influenza virus is a chameleon because it really is so unpredictable. We all know that pandemic flu will come. Definitely. One hundred percent. We just don't know when it will come. No one can bet on it.

We are uncertain about our findings and how to interpret what we know. And we're uncertain about how much we know.

While not everyone I spoke to enunciated uncertainty as clearly as those cited above,

interviews demonstrated that the issues of uncertainty form a fundamental part of

pandemic preparedness.

State healthcare actors uniformly upheld 'science' as the primary tool for engaging with the uncertainty presented by avian influenza.³ Three areas within science were mentioned as being central to the mitigation of uncertainty: understanding the virus' pathogenesis, developing antiviral medication and vaccines, and improving diagnostic procedures. These three areas are linked together through evidence-based best practices that stem from work done in the laboratory. For example, genetic sequencing allows scientists to track changes that serve in the production of vaccines and medication. Understanding changes in viral genetic sequences may allow health researchers to more accurately ascertain when the virus will become more pathogenic. Along this point, a

³ I did not ask those interviewed to define precisely what they meant by 'science.'

virologist mentioned that "scientists are looking at the molecular bases on how can you tell from the DNA and so on whether a virus can be transmitted easily." Though further research is required, working towards these ends represents bringing what was previously unknown into the realm of scientific knowledge, and thus the mitigation of the uncertain. In terms of diagnostic uncertainty, the same virologist explained that Hong Kong had strengthened "laboratory capacity, both in terms of quantity and quality, to test for these viruses more accurately." He added: "It is best if you have two independent laboratories working on the same sample and ensuring the same results. This ensures that there is consistency between the results and it's not a false-positive."⁴

Scientific methods are further used to analyze the influenza pandemics of the past in order to construct current preparedness protocols. The Centre for Health Protection Infectious Disease Controller explained this point at length. "You can take reference from the history of how the previous pandemics behaved. And you will see some differences between ... each of the three [influenza] pandemics in the past century." In the absence of infections, analyzing the pandemics of the past, he explained, informs estimates that are vital to preparedness planning: How many hospital beds will be needed? How many antiviral drugs should be stockpiled? What are the expected mortality trends? Scientific estimates were not however stable, exact numbers, as different sources produced different figures based on what pieces of evidence were used. Estimates used in the drafting of preparedness plans therefore represent a range of these figures. The Infectious Disease Controller concluded by stating: "The best we can do at the moment is come up with a sensible guess… You have to have some numbers as your planning basis, but we do

⁴ A false-positive diagnostic result is when a test confirms a positive result when the sample is truly negative. There are also false-negative results, where tests confirm negative results when the sample is truly positive. Both form areas of diagnostic and statistical uncertainty.

recognize that there is some inherent uncertainty in these estimates because no one knows how pandemic flu will behave."

Science is not fail-proof or flawless, and state healthcare actors were aware of scientific limitations. A virologist spoke to this point:

Science is quite powerful to analyze and tell you a reason to why it happened, based on what has happened. But science is not very good to predict what will happen. I don't think we have a good way to deal with the uncertainty, to predict the uncertainty with what is going to happen with avian influenza. There's not a good way to improve these characteristics.

In his opinion, the main power of science lies in the detection and analysis of events in the past rather than prediction. In attempting to minimize uncertainty, pandemic preparedness relies on products of science that are reactive, such as strengthened "drug availability, vaccine availability, and monitoring systems," rather than prognostic, such as trying to "stress how you can predict something is[will] happen or not." As seen in Chapter One, the virologist alludes to the building up of measures that shorten response time as a more feasible investment over trying to raise predictive powers.

The scientific assessment of pandemic risk is further problematized by the uncertainty inherent in risk calculations (Trostle 2005; Introduction). A risk communication specialist affirmed that "all risks are uncertain... If it wasn't uncertain, it wouldn't be a risk." He went on to provide an analogy in order to explain the risk associated with avian influenza:

If you play Russian Roulette, you get a gun with one bullet. You click it. There's a risk. But if there's a bullet in each chamber, it's not a risk any more; it's a known outcome.

Using this analogy, avian influenza can be seen as a revolver in a game of Russian Roulette. Unfortunately, state healthcare actors are still uncertain of how many bullets are contained in its chambers. And after more than ten years of anticipation, some state healthcare actors were beginning to think that the avian influenza revolver might not even be loaded at all.

State healthcare actors also recognized that avian influenza was not the sole gun that could potentially trigger a pandemic: pandemic preparedness is complicated by a multitude of other infectious diseases, both known and unknown, that might cause the next pandemic. While pandemic preparedness discourse concentrates on avian influenza, state healthcare actors conveyed to me that in reality a variety of viruses could cause the next pandemic and no one was certain which one would. A risk communication specialist stated: "There are other viruses out there, which perhaps you're not even tracking... You take any scientist, any virologist, and you ask: Is it going to be H5N1? Well, probably, but they don't know." Surveillance systems developed for avian influenza detection are now more generalized, anticipating a host of different influenza strains, such as H1 and H3, and other viruses that might cause deadly outbreaks.

Risky Business: Pragmatic Healthcare Workers in Hong Kong

Healthcare is seen as a risky profession in terms of avian influenza and infectious diseases more generally. While poultry farmers risk coming into contact with potentially infectious birds, healthcare workers risk treating potentially infected patients. People I interviewed were keenly aware of this risk, especially after SARS, where healthcare workers accounted for over twenty percent of total infections in Hong Kong.⁵ A hospital director stated: "[Healthcare workers] have to be very, very careful. SARS in 2003, you

⁵ The Hong Kong Health Authority published a book entitled "Our Colleagues—the Brave Infection Fighters" (炕沿勇士永行有你, Hong Kong Health Authority 2004) documents the health sectors fight against SARS and commemorates healthcare workers who died as a result. Out of the 1,755 people infected with SARS in Hong Kong, 386 were classified as healthcare workers (医护人员), 296 of whom lost their lives (Health Authority 2004). See also <u>http://www.who.int/csr/sars/country/country2003_08_15.pdf</u> (accessed: May 11, 2008).

know, have affected a number of healthcare workers." In light of the reemergence of infectious diseases as prominent threats to health and the increased risk involved with providing healthcare, a virologist humorously lamented his career choice:

It's very challenging. Virology 20 years ago means something that you don't know, something very different. (*Laughs*) So it looks like I can spend an easier life. (*Laughs*) Unfortunately...virus becomes something that you need to pay attention... It looks like we have new things coming up, every month, every year.

A field epidemiologist at the Centre for Health Protection further speculated that healthcare workers risk perception could be differentiated according to how much one had to deal with infected patients: "I would imagine those healthcare workers that have to take care of patients, real patients, they may feel the pressure in different ways... It is natural for them to perceive risk at a higher, you know, sort of pitch." A nurse who had dealt with SARS patients at Queen Elizabeth Hospital, however, asserted that although she recognized the risk of transmission, she was not afraid of infectious disease outbreaks precisely because of her experience with treating infected patients.

Almost all people I interviewed had had first-hand experience with outbreaks of either H5N1 or SARS in Hong Kong. Although both were admittedly frightening events, particular in light of the novelty of both diseases, healthcare workers remained undeterred. The following quotes about their experience elaborate this point:

In terms of how I feel about all of this H5 risk, personal susceptibility so to speak, I remember in 1997 when we had that [avian influenza] outbreak, I was often involved in those field investigations. So I got to see some families, you know, who have unfortunately have come up with H5 infections. I went to some poultry stores and took some samples. I, at that time, I was not very concerned about getting the infection myself. (*Laughs*) Because I had the feeling that it was not very transmissible. So I just took a mask and then I made sure that I washed my hands afterwards. And that's probably okay.

I also, you know, investigated some SARS families and outbreaks and so on, so I was a little bit more worried then, but still, that did not prevent me from going to some SARS outbreak places.

In general, if you talk to any of our clinicians they will say: 'What's the big deal? It's part of our job.'... Even during SARS, although we've got a lot of people who got infected... all the people actually volunteered to go taking care of the SARS patients. There's nobody escape from the scene... This is actually something that we are very proud of in Hong Kong. So I think that when another outbreak comes it will be the same.

In the face of uncertain information and potential infection, the healthcare actors spoke of a "professional spirit" and determination amongst healthcare workers in Hong Kong that unwaveringly resolved to confront any challenge that might arise in the future.

Recognizing the risks posed by the avian influenza virus, state healthcare actors were pragmatic in how they personally viewed preparedness practices: preparedness should be taken seriously but beyond attention to basic hygienic measures, nothing in particular could be done. When I asked if he took any personal measures to prevent against infection, one person bluntly told me: "No, because there is nothing to take personal measures about." People emphasized that during periods of crisis they had more pronounced adoption of "very simple practices," such as washing hands properly, avoiding crowded places, wearing a facemask and other personal protective equipment, and not coming into contact with infected birds or their fecal matter.

In the current pre-crisis period, however, individuals' preparedness practices seem to wane, even among healthcare workers. This point was only overtly expressed to me by two of the state healthcare actors I interviewed, yet statements made by others also elucidated this decline. One actor spoke of the decline of preparedness practices without specific reference to who she was referring to.

Just after SARS, everybody will be very alert about infectious disease. They keep the resources priority top in the infectious disease... but after that, lesser, and lesser, and lesser... After SARS, a little bit better because the broadcasting [that] everybody who got the flu-like symptom should wear a mask. But you can see that after the years everybody go back to the condition before SARS.

In another interview, healthcare workers were more explicitly mentioned as failing to

conform with official preparedness practices:

Immediately after SARS in the hospital, everybody will welcome an influenza vaccination. But as the time goes by, the percentage of coverage is lesser. Yes, in the first year, in the end of 2003, [the] Hospital Authority initiate a free vaccination for the healthcare worker... Everybody queues up outside our ward "Oh, can I have the injection more quick, right away." Alright. And the year next, in 2004, before winter surge, maybe somebody "Oh, I got pregnant, maybe I will not have the injection." "Oh, I've got diabetes." "I have got chronic illness, so I think I am not suitable to have the injection." "Oh, I have got some flu-like symptoms. I am so tired. So I probably will not have the injections." And in 2006, "Don't tell me about the injection, I'm not afraid about the SARS." You can see the few changes in people's minds.

Recent studies have specifically targeted Hong Kong healthcare workers' compliance

with annual influenza vaccination, and have found that prevalence has dropped

significantly from post-SARS vaccination levels (Tam et al 2008, Tam et al 2007).

The challenge of maintaining a state of alertness is not only difficult for the public at large, but also among healthcare workers. A hospital director elucidated that all hospital staff, including clinicians, doctors, nurses, and support workers, must undergo infection control training and attend retraining sessions once every 18 months. Training, he explained, aimed to instill "a general sort of awareness and culture" that encouraged "proper hand hygiene and proper infection control procedures to make sure to reduce the risk as much as possible." In order to ensure that training was being integrated into hospital staff's day-to-day practices, this hospital conducted regular hygiene audits. For example, the hospital director said: "We go to the ward and then we look at the staff to look at whether the staff have actually washed their hands according to the guideline procedures." The hospital director assured me that these audits were satisfactory and that hospital workers were compliant. Measures of policing the hygienic practices in the hospital, he stated, had already helped in the control of sporadic infectious disease outbreaks. Such measures point to the difficulty of maintaining a state of alertness and compliance with preparedness practices, even amongst healthcare workers (Chapter One).

Finally, the Cantonese preference for freshly killed chickens and the risk it posed to preparedness was raised by several state healthcare actors. The Hong Kong government has put forth plans that would centralize the slaughter of all chickens in Hong Kong and eliminate market stalls that sell live chicken throughout the territory, much as it had done with the sale of waterfowl (Chapter Three). In line with the logic of preparedness, by centralizing chicken slaughter, human contact with potentially infected poultry would be drastically lowered and as a result, so would the risk that human H5N1 infections would arise in Hong Kong. Centralized chicken slaughter was not a very popular idea, however, as it would "change the style of cooking" that relied on a Cantonese culinary penchant for freshly killed meat. The CHP's Infectious Disease Controller stated:

I think the community will take some time to get used to some other types of poultry, apart from the live chickens. (*Laughs*) And then by the time, in two, three years, perhaps time is ripe for Hong Kong to get rid of the live poultry markets.

Several state healthcare actors spoke of their personal preference for freshly killed chicken and their mixed feelings on the prospects of centralized slaughterhouses. One reason why state healthcare actors had few concerns about eating chicken lay in their

confidence in the system of surveillance put in place to maintain food safety in Hong

Kong. A virologist stated:

I have confidence in the local system. I can say that Hong Kong live chickens are the world's most intensively tested chickens in the world. (*Laughs*) They have to go through so many tests and checks before they can come up to your table and get served.

Although state healthcare actors understand the logic behind preparedness measures that

would see the centralization of poultry slaughter, their avowed preference for freshly

killed chicken illustrates that state healthcare actors personal practices do not always

follow state practices that target avian influenza.

Conclusion

In 1894, the year of the first outbreak of plague in Hong Kong, Governor William

Robinson concluded his review of the year as follows:⁶

The history of the year is essentially the history of a malignant disease permeating every channel of the Colony's lifeblood and arresting circulation for a while; but it is also the history of a marvelous recovery, indicating a wonderful vital power. To some the experience of the year will furnish food for bitter disappointment at the non-fulfillment of great promises and possibilities; to others, who take a more optimistic view of things, they will lend additional confidence in the resources of the Colony, and renewed hope for the future. For myself, looking backward to the past melancholy experience, and forward to the good that must result therefrom, I am tempted to remark: *Forsan et hœc olim meminisse juvabit* (Hong Kong Annual Report 1894, 20).⁷

Just over 100 years later, the former colony was stricken by the first human cases

of H5N1. Although the 1997 H5N1 outbreak and subsequent H5N1 and SARS outbreaks

affected the territory in a very different way than plague had at the turn of the century,

Governor Robinson's words resonate with how state healthcare actors spoke to me about

⁶ Sir William Robinson was the 11th Colonial Governor of Hong Kong and served from December 1891 to November 1898. He had previously been the Colonial Governor to the Bahaman Isles (1874-1880), the Windward Islands (1881-1884), Barbados (1885), and Trinidad and Tobago (1886-1890).

⁷ From Vergil's *Aeneid*. Translation: "Perhaps someday it will bring pleasure to remember even these things."

avian influenza pandemic preparedness in Hong Kong. Drawing from the lessons of the past, state healthcare actors were confident in preparedness practices they had worked to implement that sought not only to recover from damages wrought by infectious diseases but to also strengthen measures that maintained the health of the territory. Instead of focusing on the uncertainty that pervades pandemic preparedness, state healthcare actors look sanguinely on their role in preparedness, and demonstrated a determination to confront the health challenges of the future. Interviews exposed gaps and deviations between actors' personal practices and official state preparedness discourse and practices (Chapter One), problematizing the presumed indistinction between the state and its actors. State healthcare actors did not, however, question the need for preparedness, but rather held a pragmatic view on what could and could not be done. Like Aeneas and Governor Robinson before them, state healthcare actors already reflect positively on the past and optimistically about the future.

Chapter Five: Preparedness of Another Kind

I arrived to Shenzhen on the Kowloon-Canton Railway (KCR) along with morning commuters making their way from Hong Kong to the Mainland. Customs moved quickly and I soon found myself stepping out into a large open space bounded by a tall shopping complex, a train and long-distance bus station, and wide congested streets that seemed almost impenetrable. Already running a bit late, I decided to forego public transport that almost certainly would get stuck amid the morning traffic and quickly made my way towards the complex's taxi stand.

Maneuvering through the rush of buses, cars, and bicycles, I was eager to speak with my taxi driver about his experiences in the city. He was a native of Sichuan Province who had come to Shenzhen in the late 1990s in search of economic opportunity. Although he had planned to stay in the city for only a couple of years, he met his wife, married, and had a child. He missed his hometown, and tried to return during the Spring Festival and October 1st National Holiday, but admitted he was not always able to make it back. He inquired what I was doing in Shenzhen. After a short explanation, I asked him what he thought about avian influenza and what he felt his risk was living in the city. He responded by stating simply: "If you hadn't had brought it up, I would not have said anything" (如你不提, 我也不会说).

The taxi driver's immediate response and subsequent disavowed concern for avian influenza points to a different kind of pandemic preparedness taking place in Shenzhen. During my brief research stay, I came to see pandemic preparedness in a very

different light than I had in Hong Kong, even though I was only a short public transport ride away.¹ My time in Shenzhen provided a window for contrasting pandemic preparedness in Hong Kong-SAR: while avian influenza was an important social entity in Shenzhen, the ways that the state and state healthcare workers engaged the uncertainty of a future avian influenza pandemic exposed a preparedness of a different kind.

Shenzhen in Brief

According to the Shenzhen Statistical Yearbook (*Shenzhen Tongji Ju* 1991), until recently, the area now known as Shenzhen had been Bao'an County for almost two millennia.² Comprised of a collection of agricultural and trading communities, Bao'an County lay quietly at the edges of British colonialism until it was officially liberated by Chinese Communists on October 15, 1949 (*Shenzhen Tongji Ju* 1991, 10), two weeks after Mao Zedong famously declared the foundation of the People's Republic of China atop the Forbidden City's Gate of Heavenly Peace. The death of Chairman Mao in 1976 and subsequent political, economic, and social reforms completely changed the face of the Bao'an County forever.³ Under the leadership of Deng Xiaoping, the Chinese government began to move away from stringent Maoist socialist ideals to a more moderate position under the slogan "Socialism with Chinese Characteristics." The government sought to experiment with capitalism, albeit to a limited extent and within strictly confined spaces. Located adjacent to the thriving British colony, Bao'an County was spotlighted as the perfect site for such experimentation. In 1979, Bao'an County

¹ I was in Shenzhen for a total of eight days.

² According to the Shenzhen Statistical Yearbook (*Shenzhen Tongji Ju* 1991), the area now known as Shenzhen was first settled five to six thousand years ago during China's Neolithic Period (新石器时代). The area was officially named Bao'an County in 331 AD during the Eastern Jin Dynasty (317-420 AD). Although Bao'an County gained prominence towards the end of the Ming Dynasty (1378-1644) as a seafaring commercial center, trading primarily in fish, salt, tea, fragrances, and rice, it remained an agricultural outpost well into the twentieth century.

³ This collection of reforms is known as 'Reforms and Openness' (改革开放).



Figure 5 Shenzhen Population (1979-2006) contrasted against the population of Hong Kong for the same years (source: *Shenzhenshi Tongji Ju* 2006, Hong Kong 1980-2007).

officially became Shenzhen City, and the following year was designated China's first "Special Economic Zone" (SEZ) (经济特区): an area marked by more liberal economic laws and regulations that aim to stimulate economic activity and attract foreign investors (see Ong 2006).

New economic opportunities attracted an onslaught of migrants from across China and beyond. In 1980, the official total population was estimated at 333,000. By 2000, the population had surpassed that of Hong Kong at just over seven million and by the end of 2006, the population was estimated at nearly 8.5 million (*Shenzhen Tongji Ju* 2007; see Figure 1). Shenzhen's population is officially subdivided into two categories according to residents' official household documents (户籍): permanent residents (户籍人口) and temporary residents (非户籍人口). Possessing permanent or temporary resident documents allows citizens to have access to state services, such as education, healthcare, and social insurance. A large group of people come to Shenzhen without proper documents and must live outside the official channels of internal migration in China. This group of people has been termed China's 'floating population' (流动人口) because of their high levels of mobility resulting from economic insecurity and inability to access state services (see Zhang 1999). Shenzhen's floating population is estimated at over 2.5 million, making the actual total population approximately 11 million (personal communication).⁴

Disease Control and Prevention in Shenzhen

When I visited in September 2007, the main headquarters of the Shenzhen Center for Disease Control and Prevention (CDC) was composed of two buildings that housed offices, laboratory space, and research facilities.⁵ The buildings were located within a small gated complex on a pleasant side street, not far from one of Shenzhen's major intracity traffic arteries. The buildings themselves were unassuming and simple, if not slightly dated, built in the recognizably Mainland Chinese-style that favors cubical edifices covered by millions of tiles. The surrounding area was a similarly non-descript combination of small shops, restaurants, and housing blocks. I was informed that construction of a new state-of-the-art building with modern facilities had already commenced and the workers at the CDC were looking forward to their new upgraded headquarters.

⁴ Shenzhen's large migrant population has led to several unique characteristics within the special economic zone. For example, people in Shenzhen communicate primarily using Mandarin Chinese (普通话) and not Cantonese (广东话), the Chinese dialect spoken most commonly in Guangdong Province. It is interesting to note that out of the all of the people I came into contact with at the Shenzhen CDC, only one had actually been born in Shenzhen.

⁵ During my week in Shenzhen, I spoke to various state healthcare actors at the Shenzhen CDC both formally and informally. I was also escorted to several of the Center's affiliated institutions, visiting a hospital, a community health center, a public school, and a market that sold live birds. In total, I conducted 10 formal interviews in Mandarin-Chinese.

Founded in 2002, the Shenzhen CDC replaced the Municipal Health and Anti-Epidemic Station (市防疫站) and is currently in charge of disease monitoring, control, and prevention under the guidance of the Municipal Health Bureau (市卫生部). The CDC also serves as an important education, research, and training institution, with over one hundred students at the Undergraduate and Master's level. International collaborations have fostered exchange programs and promoted global standards of disease management.⁶ As a result, the Shenzhen CDC has been recognized at both the provincial and national level as a leader of healthcare and innovation, and holds several major research grants. The CDC's greatest contribution to healthcare in China has been the creation of an electronic reporting and surveillance system. Developed prior to the 2003 SARS epidemic, this system provides hospitals and clinics a virtual platform for entering cases of infectious diseases that can then be compiled and analyzed by a central source. Having proven its utility in analyzing cases of SARS in Shenzhen, the system has since been expanded and served as the prototype for the national reporting and surveillance system managed by the Chinese Ministry of Health.

Preparedness protocols in Shenzhen follow the Chinese National Preparedness Plan (*Zhonghua Renmin Gongheguo Weisheng Bu* 2004), and I was told that Shenzhen had taken measures to both meet and surpass these guidelines. In addition to an extension of the electronic reporting and surveillance system, cases of infectious diseases are now reported on a daily basis by all hospitals in Shenzhen. If particularly unusual cases are presented, I was told that the appropriate people at the CDC would be contacted directly

⁶ Links have been established with the following institutions: the Chinese University of Hong Kong, Washington University, Sydney University, the United States Center for Disease Control and Prevention and Canada's National Microbiology Laboratory.

via their personal mobile phones. Hospitals in Shenzhen are now meant to have 'Fever Clinics' (发热门诊) on hospital grounds but separated from the main hospital buildings. At a fever clinic that I visited, patients' temperatures were taken upon arrival and patients with fevers of over 38 degrees centigrade were isolated in a specialized ward. Fever clinics appear to be part of a larger project of allocating special spaces that will be used during future infectious disease outbreaks. I was told that quarantine areas have been designated for the city at hospitals, clinics, schools, and other special areas that will serve as temporary quarantine structures. Shenzhen has also banned the sale of antibiotics and other drugs at pharmacies without a doctor's prescription. The ban is meant to encourage people who are sick to visit doctors for appropriate medicines. In doing so, people are funneled into the avenues of disease detection that necessitate hospital or clinic visitations.

Several reasons were given for why pandemic preparedness in Shenzhen was taken more seriously than in other places in Mainland China. First, Shenzhen was a center of finance and I was told explicitly by one health official that "money is not a problem in Shenzhen." The City's gross domestic product in 2006 was 1.59 billion *Yuan*, representing an increase by almost three thousand times that of 1979 (*Shenzhenshi Tongji Ju* 2007, 34). Although it is difficult to ascertain public health expenditure from official documents, as its expenditure is lumped together with expenditures for the Science, Education, and Cultures Departments (科教文卫事业费), this category of expenditure has shown consistent increase and was listed at an all time high for 2006 (*Shenzhenshi Tongji Ju* 2007, 33). Second, Shenzhen's population size and density require more meticulous health surveillance and management as they are among the highest in China.

Shenzhen has the fourth largest population in China, behind Shanghai, Beijing, and Guangzhou.⁷ Despite a slight decrease in population growth in recent years, Shenzhen's natural population growth rate is almost two times higher than the national average (Shenzhenshi Tongji Ju 2007, 54). Third, Shenzhen's immense migrant population poses another problem to enacting preparedness. One health official stated: "Shenzhen is a migrant city. Many people come to work in factories and are not educated." Another person referred to migrants as rural people (农民) which needed to be educated on the city's standards of health and hygiene. Lower economic status and limited access to state benefits left migrants more likely to not visit doctors and continue working when sick, increasing the possibility of spreading infection. I did not get the sense that comments about Shenzhen's migrants were made in a pejorative manner, but rather reflected an attention to people who were disadvantaged and could pose a serious threat to themselves and the city. Finally, preparedness in Shenzhen is taken especially seriously because of its proximity to Hong Kong. Working relations with Hong Kong, such as the "Shenzhen-Hong Kong-Macau Tripartite Co-Operative Agreement on Emergency Response of Major Public Health Incidents," solidify a sense of urgency and pressure to maintain higher standards of disease control, prevention, and information sharing.^{8,9} Continual exchanges with Hong Kong health authorities has demanded a more pronounced attention to standards of disease control and prevention.

Since SARS, the Shenzhen CDC has also worked to strengthen relations with media outlets in order to promote disease awareness among the public. Messages

⁸ For more information on this agreement, visit: <u>http://www.dh.gov.hk/textonly/english/press/2006/060629.html</u> (accessed: May 26, 2008).

⁷ The population of Shanghai is estimated at 16.4 million, 13.6 million for Beijing, and Guangzhou 9.94 million.

Indeed, my visit to the Shenzhen CDC is a testament to their openness to outside opinion.

produced by the CDC appear in newspapers, on television and the internet, and in public spaces, such as train stations and markets. People at the CDC stated that in general the public had increased its awareness of infectious diseases and the practices that could prevent infection and transmission, such as hand-washing and the wearing of facemasks. Health authorities recognized that many misconceptions and superstitions remained and that public compliance was difficult to achieve. A doctor working at a fever clinic noted that people were worried, and frequently would come to the clinic because they thought they had avian influenza. The doctor went on to say that people did not have the custom of wearing facemasks, but might wear one when coming to the hospital and if asked by a doctor. A person at the CDC explained public compliance with health messages as follows:

People need to know about the danger, but they will only do something if they know the danger is present. Since there is no human-to-human transmission, the situation is not too scary.

In the absence of cases of avian influenza, she explained, there was no news to report and limited space in media venues should be allocated to more immediate health concerns, instead of inundating the public with unnecessary messages.

Risky Business: Selling Live Poultry in Shenzhen

In speaking with state healthcare workers in Shenzhen, both formally and informally, the risk of human infection from infected chickens and other birds was a prominent point in conversations about avian influenza pandemic preparedness. A CDC virologist stated: "The danger is really in getting it from birds. There is a bigger risk of getting avian influenza in southern China, particularly in Guangdong Province, because people eat more chickens and ducks." Everyone I asked confirmed that they enjoyed the taste of freshly killed chicken, and avowed that they could differentiate it from meat that had been frozen or was otherwise not fresh. Although health authorities recognized that the continued sale of live birds posed a challenge to pandemic preparedness in Shenzhen, they were firm in their desire to preserve markets where live or freshly killed poultry products could be purchased.¹⁰

Unlike Hong Kong where border checks decrease the risk of importing infected birds, birds sold in Shenzhen come from a variety of farms across southern China without prior checks. A manager of a market asserted that most birds sold at his market did not come from the surrounding area, but rather were imported from Hunan, Jiangxi, and Fujian Provinces. Bird inspections are conducted at markets, once birds have already arrived into the city. As a result, professions that required the handling of birds, such as poultry farmers, transporters, and vendors, were highlighted as particularly risky. For example, a doctor working out of the Shenzhen People's Hospital told me: "Work is the most important risk factor. In particular, it is those people working with birds that we are concerned about." Poultry handlers were cited as being doubly at risk: not only did they handle potentially infected birds but they were most likely less educated, migrant workers of lower economic status.

I had the opportunity to accompany health officials on a routine inspection of birds sold at a market. The market spanned an immense area composed of a main section covered by a high roof, smaller stalls to one side that lay under a network of coverings, and an ample parking lot. The sheer size of the market accommodated a multitude of goods, such as clothing, houseware items, vegetables, a variety of frozen meats, and live birds. Market stalls were neatly organized into clearly designated sections according to

¹⁰ According to the Shenzhen Statistical Yearbook (*Shenzhenshi Tongji Ju* 2007, 135), approximately 9,345,300 chickens were raised in Shenzhen in 2006, with 8.11 million of those being slaughtered. In comparison, Hong Kong raises approximately 9.13 million chickens per year.

commodity, facilitating the movement of market-goers as they navigated the large semiopen space. Posters and banners lined walls, dotted pillars, and hung from the ceiling rafters. Many carried information about sanitation and specific diseases, such as one that declared "The market is my home. Cleanliness and sanitation is everyone's responsibility" (市场是我家, 清智卫生靠大家) in white characters against a solid red background reminiscent of banners that once carried socialist slogans.

Live birds in this market were sold just inside one of the entrances, within the series of small stalls that lay apart from the main area. Cages were positioned next to one another, forming an almost continuous wall of trapped, live animals stacked three to five cages high. Chickens, geese, ducks, pigeons, and quails were the primary birds being sold. The number of birds per cage ranged from two to approximately twenty, depending on the type of bird in the cage, the number already sold, and the actual size of the cage. Each cage had a solid base just below the bottom grating, which prevented bird droppings from falling onto the cages below. I was told that cages were cleared of droppings and other debris with a hose at least twice daily. Poultry vendors stood on an elevated platform behind the cages along with an assortment of sundry items. I inquired why the stall vendors were all women, and was told that bird vending was a family business that had a gendered division of labor. During the day, women would tend to the market stalls while their husbands would work in other jobs, such as construction or as truck drivers. A CDC worker speculated that husbands would most likely be involved in the unloading of chickens, which occurred each morning between 4 or 5 AM.

Health checks were conducted by district CDC officers, who collected samples according to a spreadsheet that listed market stalls and the types of birds sold at each.¹¹ While stall owners were aware of the week in which checks would occur, they did not know of the precise day or time. Health officers wore long white laboratory coats over their quotidian clothing, along with plastic gloves and facemasks. One officer filled in the inspection spreadsheet while the other two officers used long cotton swabs to collect fecal samples that were then placed into plastic containers for later examination. The health officers moved efficiently from one stall to the next, collecting 15 samples in roughly 15 minutes. Health officers interacted minimally with vendors who calmly waited for the inspection to be completed. I was told that the vendors had been made aware of the importance of such inspections when checks began some two years ago and were now well accustomed to these short intrusions.

After the inspection, the health officers placed their samples into a large plastic box, discarded their facemasks and gloves into a biohazard bag, and took off their white coats. We all headed back to the market manager's office for tea and a discussion. Reiterating what I had heard at the Shenzhen CDC, I was told that poultry vendors knew of the risks involved in handling live birds, but did not take precautions until they felt the danger was very close. Once any danger had subsided, however, precautions would quickly relax. The market manager explained: "Poultry vendors sell so many chickens, so if one gets sick, they still feel safe. It's normal." What was not normal was the use of personal protective equipment, such as facemasks and gloves, which was seen as not as symbol of proper sanitation but of danger. Vendors had to have their customers in mind:

¹¹ In addition to the CDC headquarters, the CDC has an branch in each of Shenzhen's six districts: Futian (福田), Lowu (罗湖), Nanshan (南山), Yantian (盐田), Bao'an (宝安), and Longgang (龙岗).

customers generally wanted to feel birds in order to access their quality and might be scared off if vendors wore personal protective equipment. While the market manager and CDC workers uniformly agreed that such beliefs and practices needed to be changed, they seemed resigned to the situation, recognizing the difficulty in establishing new norms around health and hygiene.

Conclusion

Using avian influenza pandemic preparedness to contrast Shenzhen and Hong Kong reveals several similarities between the two cities while also exposing differences in how pandemic preparedness is enacted. Like Hong Kong, Shenzhen has experienced tremendous growth over a short period of time, both in terms of economy and population. Economic prosperity has allowed the city to devote resources to infectious disease prevention, and avian influenza pandemic preparedness more specifically. Shenzhen's population boom presents a 'problem of the people,' akin to descriptions found in Hong Kong governmental reports from the 1950s and 60s (Chapter Two), as the continual movement of people presents serious challenges for healthcare authorities attempting to increase public awareness and decrease disease incidence. Pandemic preparedness in Shenzhen, however, seemed to focus more on risky professions rather than the fortification of permeable borders. While state healthcare workers recognized that the public's awareness levels and compliance varied greatly, they were pragmatic in how much could be done to rectify this condition. Pandemic preparedness in Shenzhen seemed to be something that should be taken seriously, but should not be excessively emphasized. Pandemic preparedness was not the new norm nor was a 'state of alertness' (Chapter One). Instead, there was a sense that a time would come when preparedness

practices would have to be enacted in Shenzhen, but until then, health authorities had to the more immediate and pressing health concerns.

Conclusion

In this thesis, I have examined the avian influenza pandemic preparedness project in Hong Kong-SAR. Drawing upon government documents, historical archives, media representations, interviews, and personal observation, I have analyzed how the state and state healthcare actors come to understand the uncertainty presented by avian influenza in the absence of widespread cases of H5N1 and no cases of human infection in Hong Kong since the end of 2003. My investigation has drawn from anthropological studies on the uncertain and the mitigation of misfortune to analyze preparedness practices as a method for engaging the uncertainty associated with H5N1 and establishing a system for coping with portended ramifications. I argue that an engagement with risk not only allows for the avian influenza paradox to remain unproblematized within the preparedness project, but is fundamental to the very existence of avian influenza as a powerfully real social entity.

As discussed in 'Enacting Preparedness' (Chapter 1), although biological pandemic risk is difficult to ascertain, the pandemic preparedness project presents a domain in which the state and its actors can work to mitigate risk and thus the uncertain. Everyday preparedness practices form the foundation of the preparedness project in the public health pre-crisis period marked by the absence of H5N1 human infections. A lack or defectiveness of such practices is seen as constituting an amplification of risk that a pandemic outbreak will occur and the damages a pandemic could wreak. I have examined how preparedness practices are enacted at borders, through the management of space, and in people. Though the logic of preparedness might conflict with concomitant state projects and local practices, such as growing regional economic integration, population

mobility, and the continued cultural preference for freshly killed poultry, the concept of preparedness remains stable and internally uncontested.

An attention to the history of infectious disease control in Hong Kong contextualizes current preparedness practices and reveals the shifting boundary between the sanitary and the decisively unsanitary (Chapter 2: Lest History Repeat Itself). In reviewing state documents stemming back to the founding of Hong Kong in 1842, I have focused on both pathological and ideological events that have changed the ways in which infectious diseases have been managed in Hong Kong. I have divided Hong Kong's history into four general time periods: (1) colonial medicine founded on miasma theory that spotlighted racialized subjects as the epitome of poor sanitation (1842-1880), (2) the introduction of a new sanitation based on germ theory that focused on education, administration of medicines, and individual responsibility (1881-1940), (3) the post-WWII period marked by a rapid increase in population size and a marked decline in infectious disease morbidity and mortality, and (4) the reemergence of infectious diseases as an significant challenge to healthcare in Hong Kong in the post-hand-over period (1997-present). My historical review elucidates some of the historical antecedent of current preparedness efforts, both in terms of practices and ideologies used to manage infectious diseases in Hong Kong.

The culling of avian populations in Panyu and other preparedness measures employed to contain the H5N1 outbreak represent different manifestations of preparedness logic in action (Chapter 3: Beyond the Everyday). Such measures similarly aim to minimize the risk of a pandemic outbreak, yet in contrast to the widespread practices described in Chapter 1 ('Enacting Preparedness'), their existence is assuredly

not mundane, quotidian, or ordinary. By going beyond the everyday, these practices present challenges not only to health authorities but also to the population at large. In the case of the 2007 Panyu H5N1 outbreak, the uncertainty inherent in the pandemic preparedness project is pitted against important cultural practices. The state lays in contrast to the lay public, who is asked to understand an infringement on cultural practices for the sake of hygiene, safety, and the avoidance of a potential pandemic. While the public does not have much recourse to challenge such an infringement, the presence of opposing interests within media reports points to frictions that lay within the preparedness project that are exacerbated when preparedness goes beyond the everyday and points to significant social concerns in the limits of preparedness practices.

A strict division between state and lay is blurred as state healthcare actors involved with pandemic preparedness do not lay outside of preparedness practices they create or the risk they seek to avoid. If anything, state healthcare actors are more at risk of encountering infection during an avian influenza outbreak due to their profession. In Chapter 4, 'On Behalf of the State,' I revisited the pandemic preparedness project in Hong Kong through an examination of my interviews with such actors. My interviews revealed a more nuanced and varied understanding of preparedness practices and the uncertainty presented by avian influenza. Those interviewed were pragmatic in what could be done to forestall a future pandemic in Hong Kong and elsewhere. Such pragmatism was powerfully justified through first-hand experience with recent SARS and H5N1 outbreaks. State healthcare actors were confident in the practices they had helped design and establish, and were optimistic about engaging the health challenges of the future.

I concluded my discussion of avian influenza pandemic preparedness in Hong Kong with a glimpse at pandemic preparedness in the Mainland Chinese city of Shenzhen (Chapter 5: Preparedness of Another Kind). Located along the border with Hong Kong, pandemic preparedness in Shenzhen presents a foil for understanding the social construction of avian influenza. Although avian influenza still formed an important social entity in Shenzhen, the ways in which the state and state healthcare actors understood and engaged with the uncertainty presented by avian influenza differed significantly. A more comprehensive comparative investigation could elucidate these differences more thoroughly. My purpose in briefly discussing pandemic preparedness in Shenzhen has been to highlight that pandemic preparedness logic and practices in Hong Kong (Chapter 1: Enacting Preparedness) are not pervasive but vary across borders, even in Hong Kong's immediate neighbor.

Pandemic preparedness practices that aim to engage the uncertain risk posed by avian influenza and mitigate the effects a future pandemic point to a social project that occurs in the absence of widespread disease. My thesis is an anthropological documentation of this project in Hong Kong-SAR. The future of the H5N1 virus and state practices used to prevent it from causing the next great influenza pandemic remain uncertain. In working to prevent avian influenza from becoming a biological entity capable of efficiently infecting humans, such practices, however, allow for avian influenza to exist as a socially real entity. It is this process of social production of disease that I have captured here.

Appendix 1



The two graphs above represent two different types of public health disasters and are akin to the graphs presented to me at the Centre for Health Protection. **Graph 1** is a general depiction of time (x-axis) versus number of people infected (y-axis). An influenza outbreak would roughly follow this curve. Time can be divided into three zones: A, B, and C. Zone A represents the "Pre-Crisis Period," in which no or few people are infected. Zone B represents the "Crisis Period" characterized by a rapid spike in number of people infected, until reaching the 'peak number of people infected,' followed by a decline in people infected. Zone C represents the "Post-Crisis Period," in which assessments of response can occur and appropriate changes made. **Graph 2** represents a different type of public health disaster, such as a plane crash or a terrorist bombing. In this scenario, the 'peak number of people affected' would be reached at time zero and would be expected to decline quickly thereafter. Unlike Graph 1, there is no lag period between time zero and 'peak number of people affected' in which public health personnel could possibly minimize the number of people affected.

Appendix 2





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Source: http://www.info.gov.hk/info/flu/eng/pst/pst_10.htm

Appendix 3

McGill University REB-1 Research Ethics Approval.

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Research Ethics Board Office McGill University 845 Sherbrooke Street West James Administration Bldg., rm 419 Montreal, QC H3A 2T5 Tel: (514) 398-6831 Fax: (514) 398-4644 Ethics website: www.mcgill.ca/researchoffice/compliance/human/

Research Ethics Board I Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 7-0607

Project Title: Avian influenza in Southern China: an anthropological examination of pandemic preparedness

Principal Investigator: Emilio Dirlikov

Status: Master's student

Department: Anthropology

Supervisor: Prof. S. Hyde

Funding Agency and Title: McGill Internal SSHRC; McGill CDAS

Expedited Review 🗸

This project was reviewed on

Full Review

Catherine Lu, Ph.D. Chair, REB I

line 20, 2008 **Approval Period:** to

This project was reviewed and approved in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Subjects and with the Tri-Council Policy Statement: Ethical Conduct For Research Involving Humans

^{*}All research involving human subjects requires review on an annual basis. A Request for Renewal form should be submitted at least one month before the above expiry date.

^{*}If a project has been completed or terminated and ethics approval is no longer required, a Final Report form must be submitted.

^{*}Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.

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