A note on the COVID-19 Pandemic

The text (p. 296) refers to the 2003 outbreak of SARS due to factory farming of ducks and their transport to live markets in China, a pandemic resulting in approximately 10,000 cases and widespread economic disruption. Also on p. 296, the text refers to the 2009 outbreak of swine influenza (H1N1) at an American corporate-owned pig farm. In the 19 months the swine flu epidemic raged, over a billion people became ill and estimates of deaths range from 400,000 to upwards of 750,000. Most recently, in December 2019, the world was confronted by a pandemic that began in Wuhan, China. SARS-CoV-2 is the virus responsible and the disease it causes is COVID-19.

SARS-CoV-2 is a zoonotic pathogen, transmitted from other animals to humans. The precise vector, at the time of writing, is unknown. The virus is naturally hosted by bats and probably passed through an intermediate host (speculated to be pangolins), then onwards to people in the crowded Wuhan live animal market. The general point is: *people contract bacterial and viral infections from animals whenever humans and animals are in close*, *sustained contact*. Measles and smallpox, for example, passed to humans when humans crowded together with cattle at the beginning of the agricultural revolution some 10,000 years ago.

As humans exploit nature more and more aggressively, zoonotic diseases can be expected to become more common. Ebola in Africa (repeated outbreaks over the past 20 years) and MERS (a coronavirus like SARS and SARS-CoV-2) in the Middle East are recent examples. HIV/AIDS is another. From a public health policy standpoint, aggressive exploitation of wildlife, human encroachment on animal habitats, factory farming, and live animal markets are all extremely dangerous. The danger lies in the inability of human immune systems to recognize, and respond appropriately to, novel infections arising from intense contact with animals.

A further danger facing populations today arises from mobility. Historically, novel disease outbreaks typically remained isolated. Coronavirus and other zoonotic viral diseases like HIV/AIDS broke out repeatedly over history, but affected only small numbers of people in particular localities. In recent times, first the Hong Kong flu (1969), then HIV (1980s), then SARS (2003), and now COVID-19 show how rapidly infectious diseases can spread from one location to another, mostly due to the ubiquity of air travel. Unlike past centuries, within cities, provinces, and countries, as well as between countries, vast numbers of people move from place to place, carrying pathogens with them.

At the time of writing, the World Health Organization reports almost 9 million cases of and 470,000 deaths from COVID-19 (https://covid19.who.int). These numbers are most certainly underestimates because they are counts of confirmed cases. Laboratory testing is hit-and-miss even in advanced countries, absent entirely in much of the world, and health and death statistics are notoriously unreliable. Moreover, many cases of COVID-19 produce only mild illness (similar to the common cold) and health care is often not sought by those infected unless they develop complications (yet the person is infectious). In short, no one knows how many people have been infected, or are yet to be infected, but experience no illness or only mild illness.

Public health efforts to slow the rate of transmission of the virus centred on a mix of voluntary and compulsory isolation. This can work for the obvious reason that the less people are in contact with one another, the fewer opportunities arise for a susceptible person to come into contact with an infected one. To reduce social interaction, governments closed non-essential businesses, entertainment venues, schools and universities, parks and leisure centres, and restaurants and bars, beginning in January in China and ramping up elsewhere after February 2020. This action, of course, threw an estimated 20% of each country's population out of work, instantly reducing incomes and economic activity (See, for

example: https://www.clevelandfed.org/en/newsroom-and-events/publications/economic-commentary/2020-economic-commentaries/ec-202009-unemployment-costs-of-covid.aspx for an analysis of the impact in the US). More than 3 million Canadians lost their jobs in March and April 2020 alone (http://www.cbc.ca/news/business/covid-19-employment-crisis-recovery-employment-in-2030-1.5588285).

Governments in richer countries, particularly those with more progressive political ideologies and stronger senses of social solidarity, responded with subsidies and a host of welfare measures to prevent economic collapse and widespread poverty. At the time of writing, how to re-start economies around the world without sparking another series of epidemic outbreaks is proving to be an enormous challenge and a source of intense political conflict, especially in the United States.

The COVID-19 epidemic is of interest to students of the determinants of health. The epidemic brings several key issues into clear focus:

1. the intense exploitation of the natural environment, in general, and factory farming and current food production and distribution systems, in particular, are inherently dangerous to population health;

2. disease, even infectious disease, isn't some random occurrence or a natural biological process, but arises mostly from human activities;

3. the spread of infectious disease is a social process, following social networks, and the frequency, intensity, and duration of interpersonal contact;

4. the vulnerability of people to infection, the likelihood the infection will lead to complications, and the probability of death is a function of income, housing, employment, patterns of social interaction, and other important social variables such as race;

5. lower income people, minorities, and socially excluded groups are also disproportionately affected financially by the epidemic, which, as we learned in the text, has major implications for their health.

No more needs to be said about the first three points, but, at this early stage of the COVID-19 epidemic, the following facts have emerged with respect to the fourth point, the social gradient in disease and death:

a) black people in America are at a much greater risk of infection and death than white Americans (https://www.washingtonpost.com/health/more-than-80-percent-of-hospitalized-covid-patients-in-georgia-were-african-american-study-finds/2020/04/29/a71496ea-8993-11ea-8ac1-bfb250876b7a_story.html; https://www.washingtonpost.com/nation/2020/05/06/study-finds-that-disproportionately-black-counties-account-more-than-half-covid-19-cases-us-nearly-60-percent-deaths/)

b) in the UK, black people are four times more likely and Pakistani and Bangladeshi people nearly twice as likely to die of COVID-19 (https://www.theguardian.com/world/2020/may/07/black-people-four-times-more-likely-to-die-from-covid-19-ons-finds)

c) Toronto Public Health reports neighbourhoods with higher proportions of poor residents have disproportionately high rates of COVID-19 (https://www.toronto.com/news-

story/9998638-update-covid-19-has-hit-north-york-etobicoke-hardest-toronto-public-health/)

d) Recently released US data show a variety of health conditions that predispose people to severe COVID-19 disease and death systematically vary by income and race (https://www.nytimes.com/interactive/2020/06/04/opinion/coronavirus-health-race-inequality.html)

Poorer people and racial minorities are at increased risk from COVID-19 because they:

- have no choice but to work in conditions where they are exposed to many other people, most of whom share the characteristic of having to work in highly exposed jobs, multiplying manyfold the probability of becoming infected. Examples include grocery store personnel, meat-packing plant workers, agricultural field workers, and bus drivers.

- often live in congregate housing, with large numbers of people in the same household.

- may be more susceptible to infection and to complications from infection because of dietary factors and other health conditions such as diabetes and heart disease, both of which closely follow the social gradient.

Also at higher risk are elderly people, not only because their immune system is less vigorous and the likelihood of having other conditions that might make getting ill more serious is higher, but because seniors' housing and nursing homes create ideal conditions for disease transmission. Other institutionalized populations such as prisoners share the same elevated risk profile for disease and death. And because institutions are incubators of infection, those who work in them—mostly less well-educated, often recently immigrated, low-paid workers—share the elevated risk with the residents. Society has put little value on protecting vulnerable seniors (or prisoners) or the people who care for (or guard) them, thus preventive measures in nursing homes (and prisons) were weak or non-existent, leading to severe outbreaks and thousands of avoidable deaths. In Canada, Ontario and Quebec experienced extraordinary outbreaks in care homes, erupting in May 2020 as a national scandal. (See, for example, https://www.cbc.ca/news/politics/long-term-care-crisis-covid19-pandemic-1.5589097)

Returning to the fifth point noted above, the economic costs of the epidemic are also not borne equally. The consequences of public health closures and the ensuing drop in employment and income disproportionately affect lower-income people and members of ethnic minorities. Affluent and educated people often have the option of working from home over the Internet. Accountants, brokers, lawyers, engineers, IT professionals, and many other classes of well-paid, well-educated people continued to work and receive full pay throughout the epidemic-related shutdowns. Doctors performed telephone and online video consultations and received fees from provincial health care insurance plans. School teachers and university professors remained on the payroll, performing some teaching duties over the Internet. In contrast, work and regular wages disappeared for hotel, restaurant, and retail workers and many other low-paid, less educated workers. Those working poor who still had work—grocery store clerks, for example—found themselves without any child care because daycares and schools closed and placing children with babysitters—even relatives—was prohibited under the public health regulations. That disproportionately affected women in lower-paid jobs who hadn't the luxury of working from home. In the United States, ethnic minority people were twice as likely to lose their jobs due to COVID-19 shutdowns (https://www.washingtonpost.com/business/2020/05/06/layoffs-race-poll-coronavirus/). In sum, poorer, less educated people are put under enormous strain by crises like the COVID-19

epidemic because of financial pressure, food and housing insecurity, and emotional stress. We can expect to see, when the post-epidemic analyses are complete, big spikes in distress, mental illness, substance abuse, family violence, disease, and premature mortality from causes other than, but arising because of, COVID-19.

As in everything else discussed in the text, COVID-19 is not only a medical or biological problem. COVID-19 can only be properly understood as the interaction of social and biological variables. Who becomes ill and who dies are deeply patterned by the familiar social variables of income, education, housing, workplace, social status, and social network. How well a population does from a health standpoint depends on health, economic, and social policy. Countries with weak health care systems, poor social cohesion, vast inequalities, racism, and bad political leadership—a good example being the US in the COVID-19 crisis—will have terrible rates of infection and death. Countries with robust public institutions and good leadership will do very much better.