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EDITORIAL

Don't panic, it is only an emergency

"It's a dangerous business, Frodo, going out your door. You step onto the road, and if you keep your feet, there's no knowing in where you might be swept off to". - J.R.R. Tolkien, The Lord of the Rings.

Since news of the COVID-19 outbreak hit the mainstream media, I have received several calls from acquaintances about if and how they should be worried. I suspect many readers of the *Journal of Evaluation in Clinical Practice* have experienced the same. What makes communicating the risk difficult can be illustrated through a recent assignment I gave to my undergraduate class focused on how we use science in public policy. I asked the students to identify claims in the media regarding the virus and then search the literature to assess the level of support for such claims. Suffice it to say, they found several claims unsupported, and several others to be inconclusive. Not a very good grounding for providing definitive (or even satisfying) advice.

Granted, my students are not professional health scientists. However, I suspect that even those of us trained in epidemiology would have trouble in coming up with something much better, or at least good enough to put one's mind at ease. Adding to the challenge is the language used by our health officials. For example, on 30 January 2020 the WHO designated the virus a "Public Health Emergency of International Concern". To the lay public, terms such as "emergency" and "international concern" are troubling. How troubled should one be? Let us look at that terminology a bit deeper. By the International Health Regulations (IHR) definition, a public health emergency of International concern is:

> An extraordinary event which is determined, as provided in these Regulations: i. to constitute a public health risk to other States through the international spread of disease; and ii. to potentially require a coordinated international response. This definition implies a situation that: is serious, unusual or unexpected; carries implications to public health beyond the affected State's national border; and may require immediate international action.

The definition states that one necessary criteria is the disease be a public health risk to other States through international spread. That part of the definition does not stipulate what is the threshold of risk, nor does it indicate how many States must be at such risk. Influenza would meet that criteria, and yet, it typically does not merit the designation (the 2009 H1N1 outbreak is one exception). The reason for the general exclusion of influenza is found in the latter part of the definition—that is, "serious, unusual, or unexpected". Certainly, the common flu is serious, as it causes significant morbidity and mortality around the world each year. However, it is not "unusual" or "unexpected". That distinction raises another issue in how to interpret the designation. "Serious", "usual", and "unexpected" are not synonymous. The use of an "or" conjunct suggests that these are alternatives (ie, they are not all required). Something can be "unexpected" but not be "serious". The question is can something warrant risk to other States through international spread and not be "serious"? I suppose that depends on how one defines serious—something that I suspect differs between individuals and between lay people and experts. A second necessary criteria is that the disease (potentially) requires a coordinated action from the international community. Presumably, that could range from simply sharing data, to sharing and redistributing resources, to closing borders and instituting quarantine strategies for people crossing borders. Certainly, the definition can be interpreted in several different ways of differing degrees. I do not doubt that members of the WHO and epidemiologists who study infectious disease have an intuitive and somewhat consistent understanding of when the definition is met. However, one can see how members of the public trying to make sense of the designation may have difficulty.

Another issue is the communication of risk. For example, at the time of writing this editorial, the Public Health Agency of Canada had:

> assessed the public health risk associated with COVID-19 as **low** [their emphasis] for the general population in Canada but this could change rapidly. There is increased risk of more severe outcomes for Canadians: aged 65 and over, with compromised immune systems, with underlying medical conditions.

A similar statement was issued by the American Centers for Disease Control and Prevention (CDC): "The immediate risk of being exposed to this virus is still low for most Americans, but as the outbreak expands, that risk will increase." What does "low" risk mean? Lichtenstein and Newman[1] showed there is incredible variability in how people interpret verbal phrases associated with numerical probabilities. For example, the range of probabilities assigned by participants to terms that might be associated with "low", such as "somewhat unlikely", "very unlikely", and "seldom", include estimates as low as 0.01 and as high as 0.8. It has also been shown that experts can have a very different impression of risks than do lay people.[2] Classic research on risk perception shows that there is a tendency to overestimate risk when outcomes are dreadful or impact a lot of people in a short period of time (eg, catastrophic events) or when we feel a lack of control.[3] I suspect that a pandemic certainly fits that criteria in the

eyes of many. Thus, it is not surprising that some would overreact, nor is it surprising that some would not take the issue seriously.

The difficulty in communicating risk is not new to health care. Consider the example of exposure to ionizing radiation from diagnostic imaging or fluoroscopy guided interventional radiology/cardiology procedures. Such risks (if they are known) can be presented as absolute risk (eg, probability of cancer induction following exposure) or as relative risk (eg, risk as a fraction of a naturally occurring risk). The former approach is often confusing for patients—what does 1 in 1000 mean to the individual, especially in a world with poor numeracy? The latter might come across as abstract or will simply scare patients—a dose equivalent to a year's worth of natural background radiation is meaningless to someone who does not know what is the health impact of a year's worth of natural background radiation, and describing a CT scan as the equivalent of 100 chest radiographs sounds dreadful, even if the dose from a chest radiograph translates to a negligible risk to the individual. Of course, all that assumes you have a good understanding of the risk to the individual. People navigating a pandemic are worried about the chance they will get sick, and a population estimate is often not helpful in informing that.

Estimating the risk associated with this particular virus is difficult. As I write this editorial, we have 153 503 confirmed cases, with 5789 deaths. That works out to a case fatality rate of 3.8% or 1 in 26.5 cases. That is a very high fatality rate from the perspective of an epidemiologist. However, we do not know the true denominator, as there is a higher probability of being tested if your symptoms are severe. Thus, it is likely the risk of fatality is lower, but how low is anyone's guess (it depends on the validity of the assumptions in your model). The infection rate is also difficult to understand. China has a population of 1.4 billion people and has recorded approximately 80 000 confirmed cases. That would put the risk of infection at 1 in 17 500. We know that is certainly incorrect, given that again (a) we do not know how many people were actually infected—many have mild symptoms and/or do not get tested, and (b) the excellent response in China to reducing the spread of infection through the implementation of testing, tracing, and quarantine and other social distancing measures. We also need to consider contextual differences, such as population density, demographics, health care resources, cultural practises, etc., that complicate the extrapolation of experience from setting to another.

Given the speed at which such infections can move through the population, we may not have time to wait until we have definitive answers on risk of infection and case fatality rates before we implement measures to mitigate both transmission and potentially overwhelming scarce healthcare resources. That means we may need to rely on the judgement of experts, such as those with knowledge of infectious disease and public health. On the other hand, we must be very careful in how we formulate messages to the public so as to avoid inducing an over-reaction or complacency. So what are we to tell people when they ask about their risk and are seeking advice on if they should go to work, be with friends, etc.? To tell them that there is nothing to worry about is not only incorrect, but it damages trust in science, especially if things turn out differently than what the experts are predicting (which will likely be the case, as their models are not perfect, but hopefully any error ends up in our favour). Nor is it correct to tell them that the situation is dire, as it is not clear how many people in their community will ultimately suffer. My personal belief is that we must be realistic in regards to what we know and that it is always best to be honest about that. What is wrong with simply saying that we do not know what is going to happen, but we know that there are certain activities that will mitigate risk, and it is best to err on the side of caution? That might not be a satisfying answer, but it is better than telling people to stock up on water and toilet paper, which seems to be what people are telling each other.

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ENDNOTES

*https://www.who.int/ihr/procedures/pheic/en/

†https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html

‡https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fsummary.html

§See Mercuri and Gafni[4] for a discussion on the potential danger of extrapolating information from populations when assessing what will happen for the individual.

**https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6, accessed March 14, 2020.

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