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EDITORIAL

Learnings for Health Economics from the Early Stages of the COVID-19 Pandemic

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As I write, in March 2020, the world is in the early stages of dealing with a novel strain of coronavirus that emerged in China and spread worldwide. Whilst research is being conducted on and about the virus, the topic of this editorial is not the virus per se, rather a reflection of the implications for our field. I look at how we stand compared with adjacent fields and the implications for health economics (HE).

1 Where Health Economics Compares Well

Over the past few weeks, models of the pandemic have started to emerge. Like many economists, I have read these with interest. The focus of models available to date differs from those we typically see (in focussing on the spread over time rather than the total impact), but they are not far removed from the models regularly published in HE, especially where infectious diseases are involved [1]. However, as a whole, we do seem to compare favourably as a discipline in two areas: transparency and sensitivity analysis.

On the transparency front, seldom will you find an HE presentation, paper, or material that does not include a model diagram and a table of inputs. Although it may not always be possible to perfectly recreate models from reported data, we can get fairly close [2]. This has not been the case for many of the COVID-19 models released to date. They may have been written up under time pressure (and thus are not necessarily generalisable to the models built by entire fields), but it is hard to critique a model properly without seeing the inputs used. Similarly, model and data structures are vitally important and can determine much of the shape of the final results.

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More reassuring is the approach we take as a discipline to sensitivity and scenario analysis. As modellers, we know that some inputs are massively influential on results, and rarely are we certain of their true values. Given this uncertainty, it is rare to find HE work without extensive sensitivity analysis to consider both the parameter and the structural uncertainties—more often than not accounting for the correlation between parameters. Of the epidemiological models reported to date, too few have taken such a rigorous approach—in many cases relying on point estimates with little consideration of 'other states of the world'. Where outputs are similar, probabilistic estimates may be approximated by deterministic runs for expediency (for example, in sensitivity analysis). However, even then, for the main results the underlying uncertainty should be propagated through models, especially where so many unknowns exist [3].

2 What Health Economics Can Learn From the COVID-19 Work Presented to Date

Although HE does appear to perform strongly in presenting numerical summaries of model results, research is increasingly showing the importance of how uncertainty is communicated [4]. Even when we have many facts at our disposal, we are considerably more certain of some facts than others—for example, in the case of COVID-19, the number of deaths, as opposed to the number of cases (which is dependent on how many tests are performed and on whom). To reflect uncertainty, the UK government scientific advisors have stated not only estimates but also their confidence in their estimates of effect sizes [5]. This approach was taken from another high-profile modelling effort of even greater importance than COVID-19—that of the Intergovernmental Panel on Climate Change (IPCC) [6].

Given the volume of evidence that is surrounded by uncertainty, the IPCC have sought to standardise the

language used to communicate uncertainty, backed by behavioural science research. If the IPCC provides estimates or statements, they use a standardised language: an outcome stated to be 'very likely' in all cases will mean it is predicted to happen with 90–100% probability. The IPCC work then goes further by discussing the degree of agreement in the evidence (low, medium or high) and the quality of evidence (limited, medium or robust) [7]. Standardisation of an approach to describing uncertainty in HE would avoid misinterpretation, both within and outside our discipline, using a common currency. As a starting point, we could do a lot worse than adopting the excellent work of the IPCC – as has been done for COVID-19 scientific advice.

The second area where HE could stand to learn is in involvement and impact on policy and the media. Over the past weeks, terminology from other areas such as R_0 (the basic reproduction number of a disease) and 'exponential growth' have made their way into common parlance. However, HE has not (for whatever reason) managed to convey the concept of opportunity cost. Sadly, media discussions on the level of 'lockdown' required around the world present a false dichotomy between lives and 'the economy', generally defined as gross domestic product. As a field, we know that trade-offs are regularly made between health and wealth—ultimately because of the problem of scarce resources. More concerning is the (near absent) discussion around the opportunity cost of the policies pursued in terms of health impact. This applies to the direct effects of postponing usual care and enforcing isolation on households (with health impacts) but also indirectly the health gains that could be achieved with more funding in less exceptional times. Some notable examples of prioritisation are coming to light [8], but once HE models have been produced we will see estimates of cost per life-year (potentially quality adjusted), which will lay bare the choices that have been made. If decisions are shown to be cost effective, this will seemingly be by accident as opposed to by design.

3 Implications for Health Economics

However, the crisis that has emerged has shone a light on other areas that HE is not alone in facing. The first of these is the speed of science and peer review. Given the rapidly evolving nature of the situation, pre-prints have played a large role in the scientific discussion. Some of these are excellent [9], but many contain notable flaws and/or unstated limitations and would be unlikely to be accepted for publication in their existing format—underlining the importance of peer review as quality control. There have been examples of good science done quickly [10], but—for the most part (as would be expected)—publication incorporating peer review cannot keep up. In COVID-19, this can be explained by how quickly the virus and containment measures have emerged, but it is not explainable in our field—in what have been less urgent times.

HE cannot (and should not try to) speed up the scientific process or dictate to other groups—especially on something as fast moving as the current crisis. However, we can get our own house in order. At present, it is not unusual to wait 6 months (or more) for peer review comments—leading to work appearing in press over a year or more since it was submitted (indeed, submission and formatting of papers can be a painful process in itself). At the same time, as researchers, we are inundated with peer review requests in addition to our actual jobs—these come with little recognition or appreciation. A more sustainable solution needs to be found, likely involving public recognition and/or some form of (token) monetary reward.

At its foundation, the peer-reviewed publication process exists to deliver thoroughly reviewed research in a timely manner. It is an expensive exercise but is increasingly not delivering as the volume of research has increased. Since most of us have had to rapidly become accustomed to videoconferencing, perhaps this 'lockdown' time could be used to gather stakeholders and look for a more expedient and fairer way of doing things? Simpler processes for submission for authors, a charter of minimum standards for journals to adhere to (in review time, decision times, and time to online publication), and recognition for reviewers (whatever appropriate form that may take). For some publications, this will only formalise what they are doing already; for others, it would give authors reassurance on how their work will be handled.

A second reflection is on the 'rule of rescue' [11] and whether we truly understand public preferences. Interestingly, the UK National Institute for Care and Excellence (NICE) Citizen's Council only suggested an exception of exceeding standard thresholds to 'avert' an epidemic as opposed to dealing with the reality of one [12]. We acknowledge society is prepared to spend more to save identifiable individuals (Chilean miners, the Thai cave rescue, and many more examples)—this is the rule of rescue. But does this also extend to saving unidentifiable individuals from identifiable diseases, i.e. from COVID-19? If so, this has implications for health technology assessment—every disease assessed becomes 'special' by virtue of having a spotlight shone on it. Since the original work on this topic was produced, we have also had the introduction of the 24-h news cycle and, especially, social media. McKie and Richardson [11] discussed at length the role of media-set priorities, and their comments are worth re-reading and perhaps revisiting in this new era.

A more general reflection/implication relates to the unprecedented (at least during peacetime) changes enforced on society and healthcare services as a result of COVID-19.

These changes show that the existing systems are social constructs—things can be done differently if the will exists. If systems are now acknowledged as malleable (and this is maintained), this gives HE a chance to propose ways to improve the efficiency of healthcare systems rather than needing to treat them as fixed and work within them. This could increase the scope of potential health gains and be a small positive we can take from the current situation.

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