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COVID-19 Mortality Rates

THE CHALLENGE: MAKING DECISIONS BASED ON MORTALITY PROJECTIONS DURING THE COVID 19 PANDEMIC

Scholars trying to determine the number of deaths caused by a pandemic look at both the proportion of deaths from novel coronavirus relative to the total number of people diagnosed with the disease, normally referred to as the case fatality rate (CFR), and the proportion of deaths among all infected persons including asymptomatic and other undiagnosed infections, recognized as the infection fatality rate (IFR). Final numbers for both CFR and IFR can only be determined, and even then only estimated, once a pandemic has completely passed.

All mortality numbers generated during a pandemic are reported under challenging circumstances and COVID 19 may be even more challenging. Early fatality projections (e.g., Imperial College (London) Report 9) were large (500,000) and the model that produced them was eventually roundly criticized, but not before it affected major policy decisions. In the United States, the Centers for Disease Control (CDC) may have inflated actual counts by counseling doctors that, when novel coronavirus is so much as suspected, “it is acceptable to report COVID-19 on a death certificate.”

All of this uncertainty related to the number and contributing cause of deaths is problematic for the management of the pandemic response because policymakers understandably have to address worst-case scenarios first and foremost.

THE OPPORTUNITY: ENHANCE AWARENESS OF, AND POLICY-MAKING RELIANCE ON, A MORE COMPLETE ANALYSIS OF TRANSMISSION AND INCIDENCE OF MORTALITY.



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In approaching how to respond to the COVID 19 pandemic the medical, scientific, and public health communities understandably focused on the nature of the virus and the physical mechanics of transmission and infection. They identified the key factors linking infection and death as age, certain pre-existing conditions, and individual exposure. Given that and the historic context of public health pandemic response options (i.e., containment, treatment, and eradication), it is not surprising that the response recommended to policymakers around the world was “Containment.”

As the databases have grown over the past several months, however, it is increasingly apparent that the incidence of death is driven primarily by age (80% of death in the US to date have been 65 and older) and is exacerbated for this population by location, concentration, and access to appropriate care.

Given the current concerns about the negative economic impact of “Stay at Home” containment policies, if the current data is confirmed, policy-makers and other decision-makers will be encouraged and inclined to consider a more economically viable containment strategy focused on protecting demonstrably vulnerable populations from the virus and the less vulnerable populations.

RELEVANT ACTUARIAL PRINCIPLES

- **RISK AVERSION:** FOR A GIVEN MEASURE OF THE DEGREE OF UNCERTAINTY, WHEN CHOOSING BETWEEN TWO CHOICES WITH THE SAME EXPECTED PAYOFF, PARTICIPANTS TEND TO PREFER THE CHOICE WITH THE LOWER DEGREE OF UNCERTAINTY.
- **ENLIGHTENED SELF-INTEREST:** THE PARTIES TO AN ECONOMIC TRANSACTION ACT IN ACCORDANCE WITH THEIR PREFERENCES, SUBJECT TO THE KNOWLEDGE EACH HAS ABOUT THE ENVIRONMENT AND THE OTHER PARTIES.



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As this is being written (June 29, 2020), US deaths exceed 125,000 and concerns are growing about what may be a self-induced wave of new cases sparked by either premature and/or poorly managed efforts in a number of states to open up the economy. If, as seems likely, policymakers and public health professionals are forced to choose again between existing containment strategies and growing pressures to restart their local, state and national economies, they will make those decisions based on what they believe the existing data tells them.

The COVID-19 data contain five points likely to influence the next round of decision making; including:

- the elderly (i.e., 65 and older), particularly those with complicated health issues, are most at risk of dying from infection;
- African-Americans, men, and low-income populations are experiencing higher death rates;
- infected younger people are more likely to recover from the disease;
- environments that concentrate people in confined areas for extended periods of time (e.g., food processing plants; long-term medical care facilities) increase the likelihood of infection;
- masks can make a difference.

The economic data from the past six months also reflects key points likely to affect decision-making, including:

- the workforce population is dominated by people between the ages of 16 and 64;
- most people 66 and older receive Social Security payments;
- the shut-down hit specific employment clusters (e.g., bars, restaurants, hotels, travel) earlier and harder than others;
- the populations affected earliest tended to be younger and lower-income;
- the longer the shutdown continues the more people will be affected by lay-offs and/or furloughs;



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- the longer the shutdown continues the more existing businesses will be lost;
- having workers work remotely works for some, but not all, employers;
- keeping the economy liquid over a prolonged period of time is probably prohibitively expensive.

What these two data sets suggest is that decision-makers will have to recognize the existence of two at-risk populations, one of which is most at health risk and the other of which is most at economic risk.

In this context, two actuarial principles are instructive. The first is the observation that when choosing between two choices with the same expected payoff, participants tend to prefer the choice with the lower degree of uncertainty. This principle suggests that decision-makers will need to understand that while those most concerned with a demonstrable health risk and those most concerned with a demonstrable economic risk may be equally interested in the “lowest degree of uncertainty,” their needs in achieving that goal are very different.

The second is that parties to an economic transaction act in accordance with their preferences subject to the knowledge each has about the environment and the other parties. This principle also provides important guidance for decision-makers. Consider, for example, the importance of recognizing that at the moment any/every decision policymakers and others make related to managing COVID-19 involves an economic transaction (i.e., an impact on employers, health care providers, taxpayers, etc.). Consider also the question of economic vulnerability. On the one hand, the most health vulnerable populations are more likely to be receiving established federal and state income and expenses support (e.g., Social Security, Medicaid) than the economic at risk populations. On the other, however, the capacity of the federal and state governments to maintain that established support depends on getting the younger population back to work.



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Once again, given all of this, policymakers would be well-advised to pay very close attention to the data and to making sure that their decision-making process considers all the data relevant to the decisions they are having to make.



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