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An Alternate View of Future Mortality

By Frank Grossman

"Circumstantial evidence is a very tricky thing," answered Holmes thoughtfully. "It may seem to point very straight to one thing, but if you shift your own point of view a little, you may find it pointing in an equally uncompromising manner to something entirely different."

– The Boscombe Valley Mystery, *Sir Arthur Conan Doyle*

A seemingly inexorable trend of mortality improvement has emerged over the past century. Declining rates of population mortality in the developed Western world have been variously attributed to several causes, including: i) improved dietary standards; ii) better public health institutions and programs (e.g., immunization); and iii) better public infrastructure (e.g., emission controls and proper treatment of waste). Whether the beneficial influence of these diverse factors has substantively run its course, in terms of fostering additional mortality improvements in the future, remains an open question.

In principle, the many risks of out-of-sample extrapolation are widely acknowledged. Yet, how does this projection technique translate into contemporary actuarial practice? Trend extrapolation, long familiar to pricing actuaries, appears to have gained greater currency even among valuation actuaries of late. Is reflecting the anticipated effect of future mortality improvement as straightforward as mechanistically projecting decreases of 0.1 or 0.2 percent year after year? And could there be some risk in taking such an approach—without adequately considering the underlying drivers that may influence a change in life expectancy? One might hope for more from today's actuaries than rote application of a favorable projection scale to a given mortality table. Hence there is the need to consider whether the drivers of past mortality change are likely to be sustained into the future, and—critically—what new drivers may emerge in their stead.

The growth of "agribusiness" led to the advent of monoculture on an unprecedented scale in pursuit of the twin financial goals of greater yield and more profit. Many varieties of plants have been hybridized to grow more readily and withstand the vicissitudes of transshipment. Nowadays those living in northern climes can eschew winter root crops such as carrots and parsnips and opt for leaf lettuce all year; and tart currants and gooseberries have been virtually replaced by all-season celluloid strawberries from California. The obvious result has been ever more food at lower prices. A concomitant outcome, however, is that many people now

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consume a narrower range of foodstuffs, and a greater proportion of the population relies on a shrinking group of producers. The result has been less "diet diversity."

But what about the quality of mass-produced food? Store-bought broccoli assuredly has the form and color of the real thing, but does it convey the nutritional content that textbooks assert it does (e.g., one cup of broccoli has more vitamin C than an orange)? How much does it matter that food is improperly handled or stored—or flown halfway around the world—before being cooked and eaten? The extent to which the nutritive value of our foodstuffs is able to withstand the modern business of agriculture is a point worth considering.

Humans have consumed genetically modified (GM) foods, or livestock-fed GM-grain, for nearly a generation—it has been deemed to be safe. And maybe it is. However, students of history may recall that a factor supposedly contributing to the decline of Rome was the lead used in the construction of their aqueducts and cooking implements. The Romans literally poisoned themselves! Though marvelously accomplished in the fields of applied science and technology, it was Rome's basic ignorance of the long-term risk of contact with lead that posed a dire threat to their way of life.

Much has been written about the looming threat to the baby boomers' quality of life and mortality rates posed by Type 2 diabetes. Many factors contributing to the onset of this affliction are lifestyle-based and rooted in the pursuit of convenience: poor diet (reliance on over-processed food) and lack of physical activity. Type 2 diabetes is an example of a disease that may yet assume a different dynamic going forward than it has in the past, and consequently contribute to higher future mortality rates.

Change in habitat has led to the extinction of numerous species of flora and fauna. Is it possible that environmental degradation may translate into higher human mortality rates too? For example, climate change may enable pathogens normally killed by extended periods of frost to survive and get a second chance. And pernicious tropical diseases (e.g., malaria) may come to extend their reach into formerly

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temperate regions. Increased exposure to radiation (e.g., from the sun due to thinning of the ozone layer, or from man-made sources) also has the potential to cause more deaths. Can exceptionalism alone save humans from a fate heretofore reserved for other, lesser species?

The perennial challenge when evaluating an alternate future state is to avoid Chicken Little alarmism, focusing instead on a "rich scenario" that links drivers in new ways to arrive at a coherent story line that can support the numerics. The so-called FADI Principle was the actuarial profession's mainstay for years. (Some may still recall, even at this late date, that "[t]he work of science is to substitute facts for appearances and demonstrations for impressions" abbreviated F-A-D-I.) And actuaries have traditionally challenged conventional wisdom. The key is to continue to do so by adopting rigorous methods both to analyze historical data and evaluate future prospects.

One thing to bear in mind is that one person's established fact may simply be another person's heuristic. A couple of paragraphs after the excerpt at the beginning of this article, Sherlock Holmes remarks, "There is nothing more deceptive than an obvious fact." Therein lies the wisdom of shifting one's vantage point to obtain an alternate view of future mortality—if only for a moment or two. ▼