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The "Directionally Correct" Fallacy

In the new health economy, healthcare executives cannot afford to be satisfied with “directionally correct” – hope is not a strategy.

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The "Directionally Correct" Fallacy, Part I: An Introduction

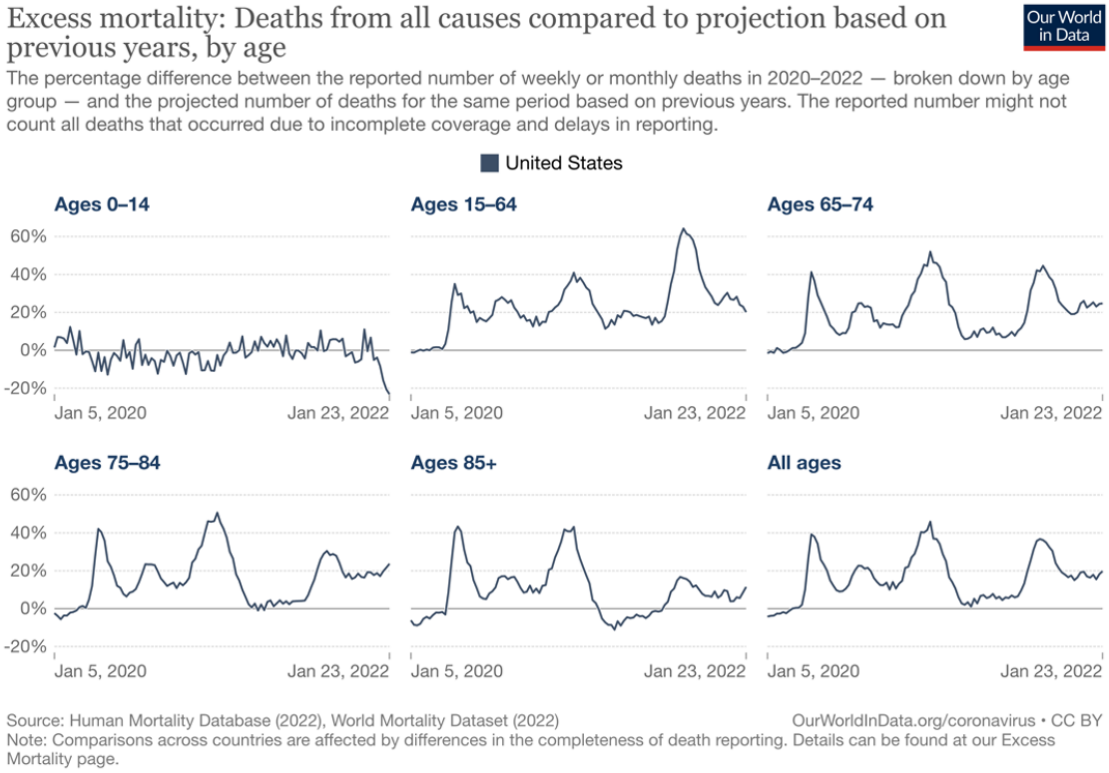
In a previous blog series, we explored this inexorable reality:

Healthcare is a negative-sum game.

Game theory is infrequently, if ever, discussed in the healthcare industry, but nothing will have a more profound effect on the health economy in the next 20 years.

"The most difficult problems are negative-sum situations, where the pie is shrinking. In the end, the gains and losses will all add up to less than zero. This means that the only way for a party to maintain its position is to take something from another party, and even if everyone takes his or her share of the "losses," everyone still loses in comparison to what they currently have or really need. This type of situation often sparks serious competition."[1]

The American healthcare pie is most definitely shrinking, with the Medicare "silver tsunami" that will not subside until 2030[2], a decline in both birth rates[3] and commercially insured consumers[4] since 2008, and a staggering increase in excess deaths in the 15-64 age cohort since the beginning of 2020:



It is impossible to win a losing game without competing, but there are several ways to compete effectively: winning key battles, cutting losses early, losing less frequently, and losing by a smaller margin than the competition. Market share is measured by wins and losses, so analyzing market share correctly is fundamental to survival.

Here is another inexorable reality:

Every stakeholder in the health economy overestimates their market share because none of them knows how many healthcare suppliers exist.

Healthcare stakeholders not only overestimate their market share but also fundamentally misunderstand the market forces that determine market share. As a result, they are incapable of predicting the future. Healthcare stakeholders who cannot predict the future default to the "directionally correct" fallacy, which manifests in "me too" strategies, wasteful service duplication, and suboptimal rates of return on invested capital.

In the coming weeks, we will explore the "directionally correct" fallacy in detail (Part II), reviewing the questions that it purportedly answers and analyzing the suboptimal decisions that result. We will lay bare the origins of the "directionally correct" fallacy in the "100% data sample fallacy" (Part III) and explain why probabilistic predictive analytics do not require a 100% data sample. We will also distinguish between "directionally correct" benchmarks and probabilistic predictive analytics (Part IV), the approach utilized in every global industry except healthcare. Finally, we will consider the risks of continued reliance on the "directionally correct" fallacy instead of using predictive analytics to develop evidence-based strategies (Part V).

Our hope is that healthcare executives will become much more demanding about making evidence-based decisions in every aspect of their business.

[1] https://www.beyondintractability.org/essay/sum
[2] https://www.census.gov/library/stories/2019/12/by-2030-all-baby-boomers-will-be-age-65-or-older.html
[3] https://www.census.gov/library/stories/2021/09/united-states-births-declined-during-the-pandemic.html
[4] https://www.kff.org/other/state-indicator/total-population/?activeTab=graph&currentTimeframe=0&startTimeframe=11&selectedDistributions=employer&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

The "Directionally Correct" Fallacy, Part II: What is "Directionally Correct"?

"Directionally correct" is the most overutilized and pernicious phrase in healthcare. Merriam-Webster does not define the phrase but does define the word "directionally" this way: "as to or with reference to direction," violating the adage that it is inappropriate to define a term by referencing that term.

Turning to the Internet, it is particularly noteworthy – and ironic – that the first result of a Google search of "directionally correct" returns a Forbes article titled "How To Speak McKinsey: 15 Key Phrases To Pass Yourself Off As A Top Management Consultant," in which the phrase is defined this way:

> **"Directionally correct."**
> **Translation:** The analysis is correct in its broad conclusions.
> **Real meaning:** The analysis is incorrect in some of its numbers.[1]

More precisely, "directionally correct" is defined this way:

"Directionally correct is an expression used to indicate that a measurement is accurate to the extent that it shows the quantity to be measured to be positive or negative even though the degree to which the quantity is positive or negative may be measured inaccurately."[2]

Healthcare executives frequently say that information is "directionally correct" when referring to physician referral patterns or market share growth projections, by which they mean that reality is not completely opposite from the observed trend. And so, it is "directionally correct" to assume that surgical care is migrating from inpatient settings to outpatient settings. How much? Who knows?

Whatever "directionally correct" means, it is vastly different from a quantitative approach based on "probability," which the Oxford English Dictionary defines this way:

"The extent to which an event is likely to occur, measured by the ratio of the favorable cases to the whole number of cases possible."

In thinking about how healthcare industry executives are appeased by "directionally correct" information in making strategic decisions, I am reminded of C.S. Lewis' words about being "far too easily pleased."[3] Implicit in every statement that a data point is "directionally correct" is a fatalistic admission that the available data is

insufficient to support an informed decision. Over time, these uninformed decisions have a compounding effect that makes winning a losing game virtually impossible. In Part V, we will explore the financial and legal risks of a continued reliance on the “directionally correct” fallacy.

[1] https://www.forbes.com/sites/brettarends/2014/06/08/how-to-speak-mckinsey-15-key-phrases-to-pass-yourself-off-as-a-top-management-consultant/?sh=6e733d576896
[2] https://www.smartdefine.org/directionally_correct
[3] Lewis, “The Weight of Glory,” p.1

The "Directionally Correct" Fallacy, Part III: Its Origins in the 100% Data Sample Fallacy

The "directionally correct" fallacy originates in another fallacy that seems to plague the healthcare industry: the 100% data sample fallacy.

For the avoidance of doubt, a 100% data sample is a mythical creature, like the Loch Ness monster or a Super Bowl championship for the Tennessee Titans. Virtually every executive in any industry outside of healthcare understands that a 100% data sample does not exist. In the healthcare industry, however, the lack of something that does not exist is frequently – and dismissively – cited as a reason not to use data for analysis.

The 100% data fallacy is self-evident upon a moment's reflection. Given the amount of healthcare that is "free" (charity care, drug samples, etc.) and paid in cash (dermatology, plastic surgery), it is obvious that a 100% data sample of healthcare activity is unattainable. The 100% data sample fallacy is also revealed by the simple fact that no one knows exactly how many suppliers of healthcare services exist.

Executives in non-healthcare industries source as much data as possible and consistently explore new data sources, making the best decisions possible from the most relevant data available. Executives in non-healthcare industries understand the adage that "everything is information." In contrast, healthcare executives are prone to decry the lack of 100% data and then either default to anecdotes and random observations in developing strategies or, alternatively, do nothing at all.

What is ludicrous about executives who are unwilling to use any data short of a 100% data sample is this: if a 100% data sample existed, none of the people clamoring for it can do anything with it. Even three years of a 100% data sample of healthcare activity would be several pebibytes (1,000 tebibytes) in size, and the typical healthcare organization would not know how to store it, much less how to analyze it.

The Don Quixote-like quest for a 100% data sample also reveals a fundamental misunderstanding developing evidence-based strategies. In developing strategy, benchmarking, which the industry has been trained to do for decades, is completely inferior to predictive analytics based on probability, which does not require anything close to a 100% data sample.

Generally, more data is better than less data. However, for probability, the longitude of a data set is more impactful than the amount of the data. For example, 10

years of data that represents 10% of actual data is more relevant to probability than 1 year of a 100% data sample.

Predictive analytics are never 100% accurate, but they are infinitely more accurate than decisions made by people who make “directionally correct” decisions in the belief that only a 100% data sample is sufficient.

The "Directionally Correct" Fallacy, Part IV: Random Guesses or the Confidence in Probability

When healthcare executives use the phrase "directionally correct," they are invariably, if unwittingly, using information about past events as a reference point for making decisions about the future. That information about past events is, in addition to being historical, often incomplete or otherwise flawed, wherein lies the "directionally correct" fallacy. Like the clinical concept of Original Antigenic Sin, in which the immune system learns to respond to a virus based upon the specific virus it first encountered, healthcare executives are inclined to make strategic decisions based upon their memory of a strategy that worked in the past. What's past is not prologue in healthcare, and so history can never be used to predict the future with 100% accuracy, which is the reason that probability theory exists.

Probabilistic decisions are based on probability, that is "the extent to which an event is likely to occur, measured by the ratio of the favorable cases to the whole number of cases possible."

The issue is not one of degree, but kind. "Directionally correct" decisions can occasionally be correct, or at least not fatally flawed, but they should never be viewed as "evidence-based." Why? Because "directionally correct" decisions are fundamentally based on insufficient evidence, whether in terms of relevance or detail, and insufficient analytic rigor.

In contrast, probabilistic predictions developed from comprehensive, longitudinal data sets and advanced data science and engineering capabilities are truly "evidence-based."[1],[2] These predictions provide a transparency that healthcare executives can, by definition, utilize with confidence to analyze potential outcomes from strategies and tactics.

Of course, evidence-based decisions are not infallible. As famed statistician George Box famously quipped, "All models are wrong, but some are useful." Importantly, Box was not referencing a projection developed in Excel, but statistical modeling, which is defined this way:

"Statistical modeling is the use of mathematical models and statistical assumptions to generate sample data and make predictions about the real world. A statistical model is a collection of probability distributions on a set of all possible outcomes of an experiment."[3]

In the new health economy, healthcare executives cannot afford to be satisfied with "directionally correct" – hope is not a strategy. Instead, healthcare executives should focus on two decision categories:

(1)decisions for which there is insufficient data to inform that decision, and
(2)decisions based on probabilistic predictions.

The former might involve future policies, technologies, or pandemics. The latter are the strategic and tactical decisions, whether strategic, operational, financial, or clinical, that stakeholders in the health economy expect executives and boards to get right.

[1] Navigating Amazon's Probability-Level Demand Forecasting with Analytics (lingarogroup.com)
[2] kris Analytics for an Online Retailer_6ef5f3e6-48e7-4923-a2d4-607d3a3d943c.pdf (hbs.edu)
[3] https://www.omnisci.com/technical-glossary/statistical-modeling

The "Directionally Correct" Fallacy, Part V: The Risk of Being Left Behind

It is astonishing that the U.S. healthcare industry, the size of which exceeds the entire GDP of every country except China and Japan, is the least likely industry to use probability models to make predictions and recommendations. Every state and federal political candidate uses probability models in every election, just as the "FAANG" companies and every retailer with a customer loyalty program do in every consumer interaction. And Las Vegas sportsbooks make eerily accurate predictions 365 days a year. But not the healthcare industry.

To be clear, the healthcare industry does indeed make predictions every day, but the quality – and resulting accuracy – of those predictions is dreadful. And to make matters worse, the healthcare industry creates "models", ironically focusing most broadly on what is least likely to be scalable, i.e., "personalized medicine."

Truthfully, much of what the healthcare industry refers to as "analytics" is simply benchmarking. Even worse, much of that benchmarking is purely aspirational, calling to mind Jiminy Cricket, as if wishing that you were as good as Mayo Clinic or Optum or J&J is enough to make your dreams come true.

Sometime in the future some combination of legal and economic forces will force the health economy to change. Until 2015, failing to make evidence-based decisions was excusable. Even if a company in the healthcare industry understood the importance of making evidence-based decisions and could gather most or all the available data, analyzing information that vast was prohibitively expensive. In the last five years, cloud computing has eliminated those obstacles for the largest industry participants, and Moore's Law suggests that the scale offered by cloud computing will soon make evidence-based decisions available to every market participant.

What is excused when something is impossible is not excusable when it becomes possible, which is an often-overlooked aspect of the legal responsibilities of officers and directors, particularly tax-exempt entities. In Wabash Railway Co. v. McDaniels, Justice Harlan defined the standard of "ordinary care":

"Ordinary care, then…implies the exercise of reasonable diligence, and reasonable diligence implies, as between the employer and employee, such watchfulness, caution, and foresight as, under all the circumstances of the particular service, a corporation controlled by careful, prudent officers ought to exercise."[1]

It is a well-established principle of corporate law that officers and directors have

the duty of ordinary care in the operation of a business, exercising the judgment of a reasonable person.[2] At some point in the future, it will become unreasonable, as a matter of law, to fail to incorporate probability-based predictions into operating healthcare businesses, especially considering the statutory duty of care required of tax-exempt healthcare organizations that, according to the IRS, operate "an implied public trust."[3],[4]

The stark reality facing the healthcare industry is that America, and Americans, cannot afford the cost of our healthcare system. In response, stakeholders in the health economy are playing the healthcare version of "hot potato," devising myriad schemes to transfer financial risk through value-based care programs, capitation, narrow networks, and health insurance benefit design. Meanwhile, the healthcare consumer has an increasing amount of information, access, and choice, a decreasing amount of discretionary income for healthcare expenses, and little guidance from health economy stakeholders who fundamentally misunderstand consumer motives and preferences. The much-heralded advent of healthcare consumerism is more accurately described as a capitulation by health economy stakeholders that have failed to inaugurate necessary change, perhaps an inevitable outcome in such a highly regulated industry. It isn't that American consumers are desperately seeking to wrest control of healthcare decision-making at a scale that even Jack Wennberg could not have envisioned, but rather that the health economy is increasingly forcing consumers to fend for themselves.

In today's health economy, every stakeholder increasingly has a legal, financial, and, arguably, moral obligation to make evidence-based decisions in every aspect of their business. Instead, today's healthcare industry is replete with point solutions delivering immaterial improvements to the innumerable ailments of the industry. In the words of the Allman Brothers, there is only "one way out" for the healthcare industry and America itself: the promise of predictive analytics to revolutionize the way that strategic, clinical, operational, and financial decisions are made.

[1] https://supreme.justia.com/cases/federal/us/107/454/
[2] https://corplaw.delaware.gov/delaware-way-business-judgment/
[3] https://www.irs.gov/pub/irs-tege/rr56-185.pdf
[4] https://www.councilofnonprofits.org/tools-resources/board-roles-and-responsibilities