SOCIETY OF ACTUARIES
MODELING SECTION

THE MODELING PLATFORM
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Models That Will Make the Cut

By Nate Worrell

I have a confession to make. I watch—and enjoy—reality fashion competition shows. I'm watching "Making the Cut" with my daughter on Amazon. It's part of our pandemic stay-at-home sanity program.

Speaking of pandemics, have you noticed that models seem to be popping up everywhere? Actuaries, university researchers, epidemiologists and governments all seem to be trying to make forecasts. What's interesting is seeing which of these forecasts end up being widely dispersed, featured in headline news stories or sitting in front of the president at the White House. In some ways, it's a real-life modeling competition.

The competition is fierce, and the verdicts can be cruel and sudden. As Heidi Klum put it in "Project Runway," "One day you're in; the next day you're out."

Being an actuary, my first instinct to understand the risks of the COVID-19 virus was to turn to other actuaries. They did not disappoint.

- Stuart McDonald first started throwing out predictions of the number of UK cases on Twitter, and his model turned out to be pretty accurate. More than that, he included lots of good discussions about shortcomings and unknowns, and he seemed to be constantly dispelling invalid conclusions from the media. Lastly, he updated his model to show the effects of interventions, showcasing how things would vary from his original forecast. McDonald is also part of the COVID-19 Actuaries Response Group formed on LinkedIn.[1]

- The Society of Actuaries (SOA) Research Team put out a solid package[2] that not only took a look at how the virus progressed, along with ample discussions of limitations, but also brought in context to give a comprehensive view that linked disease spread to hospitalization rates to economic impacts.

But I didn't see these actuarial models making it to the front page. Instead, universities seemed to lead the way. Johns Hopkins,[3] the University of Washington[4] and others got a bit more press. Why? Certainly the models from actuaries were as strong as, if not better than, any of the others. Perhaps it is a question of popularity, with other organizations enjoying more prominence among reporters.

In this case, perhaps the best competitive strategy is to form an alliance. The SOA package uses Johns Hopkins data. But is Johns Hopkins looking to the SOA? Actuaries should be in the game, but it will require some assertiveness. If you see a model in your local newspaper or on your favorite website, why not reach out to that author? Maybe there can be a collaboration in the future.

But beyond prestige, is there something else? How do we make a model mass media–worthy? Tyra Banks asked contestants of "America's Next Top Model," "Do you want to be on top?"

What if this were your orienting question as you built and summarized your model? What would you need to do differently? For mass public appeal, three traits seem to matter: aesthetics, story and punchline:

- The results of the model have to be presented in a compelling way.
- The output must make sense to a nonexpert.
- You must be able to summarize the results with a newsworthy headline.

Note that these criteria are all about the presentation of results and less about the model architecture itself.

Yes, the model should be accurate, fast and transparent. Let's not minimize these key qualities—we have a whole Actuarial Standard of Practice (ASOP)[5] about them. A model must be reliable, but it will be worthless if it takes a herculean effort to extract conclusions from it.

Compromising on accuracy or not evaluating the data thoroughly could result in a lack of trust. However, there seems to be a certain tolerance for error in models. The people who put together weather predictions, election forecasts, Super Bowl odds or buy/sell recommendations for stocks seem to keep their day jobs despite having a history of (sometimes significant) misses. And that doesn't even touch on your latest horoscope. In a world with high uncertainty, any prediction can serve as a lifeline, a light in the fog. So the main purpose and value of a predictive model may not be in the actual prediction, but rather in having a voice that sets a journey in motion. Set a course now and refine later, turning in a new direction if you must. To be clear, I'm not suggesting that we be satisfied with models that are "good enough" or simply directionally accurate. Rather, being bold with a flawed model may yield more exposure and attention than hesitating and waiting for a more perfect model.

Let's elaborate on the criteria of aesthetic, story and punchline from a tactical perspective.

MAKE IT PRETTY

The good news is that there are lots of software options that can do this for you. Time matters. The first to show results has an edge over any followers, even if the newcomers are more accurate. Building graphs in Excel may be a great way to kill time on the weekend; it is not a winning strategy.

Take the time to learn how to use data visualization tools, how to build something interactive (new SOA research[6] is moving in this direction), and how to understand design principles.

MAKE IT MATTER

What makes a great story? Certainly the writing matters, and a clever concept counts, but at the end of the day it comes down to emotion. Do you see yourself in the story?

A useful element that can add depth to any chart is some sort of comparison mechanism. How does this result compare to something I know and can relate to? Think of COVID-19 vs. influenza.

A story is more impactful if it is easy to understand. The harder readers or observers have to work to digest the information, the more energy they spend on logic, with less remaining to spend on emotion. Things like numbers with lots of different digits and percentages are inherently complex.

- It is easier to absorb $3.5M than $3,489,750.
- One in 5 is easier to imagine than 20 percent.
- Be clear about absolute vs. relative risk. The former tends to be more useful.

I've been a judge and mentor for the Actuarial Foundation's Model the Future Challenge for the past couple of years. The winning teams use strong models, but a lot of strong models get turned away because the message gets lost. Strong communication elements take models to the winner's circle.

How do the dots connect? What is the takeaway message?

MAKE IT NEWSWORTHY

Nuance doesn't matter. Caveats are worthless. Spin a sensational statement instead.

My fellow actuaries may find this approach blasphemous and reckless. It goes against the fabric of the mathematical mind. Our default position and strongest statement is usually "It depends."

Is that the answer you hoped for when you asked your spouse to marry you? When you wanted to know if you'd make it out of surgery alive? There needs to be something bolder, something more definitive to latch onto.

Leave the dissection and debate about details to academic journals and Twitter threads.

To add more drama to the claims, consider a couple of key questions. Who wins, and who loses? What are the fears and hopes of the people who will see this output?

Imagine you were presented with a month-end result titled "Excess Lapses Challenge Company Profits—Just a Blip or Long-Term Trend?" It may seem a bit dramatic or hyperbolic, but that's the point. I'll concede that being an alarmist may not be a welcome feature in your day-to-day job, but in the world of public consumption, there needs to be a "wow" moment.

As a bonus, I want to throw out the idea to make it yours. What is your data output style? Do you like a certain color palate, a certain font? If I look at a series of charts, can I pick yours out from the rest?

THE REAL PURPOSE OF MODELS

Models are more than just mathematical applications: they are communication devices. To really serve members of the public—to get our objective, disciplined work into their hands—we need to appreciate that message delivery is as important as message content. Model output needs a powerful package.

Otherwise, we'll hear Heidi Klum say, "Auf Wiedersehen," as she blows us a kiss good-bye. ■

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ENDNOTES

1 COVID-19 Actuaries Response Group, *LinkedIn*, 2020, *https://www.linkedin.com/company/covid-19-actuaries-response-group/*.

2 Society of Actuaries COVID-19 Research, 2020, *https://www.soa.org/resources/research-reports/2020/impact-coronavirus/*.

3 "COVID-19 Dashboard by the Center for Systems Science and Engineering," Johns Hopkins Medicine & Science, 2020, *https://coronavirus.jhu.edu/map.html*.

4 "COVID-19 Projections," Institute for Health Metrics and Evaluation at the University of Washington, 2020, *https://covid19.healthdata.org/*.

5 "Modeling," Actuarial Standards Board, June 2013, *http://www.actuarialstandardsboard.org/asops/modeling/*.

6 "Fifty States, Fifty Stories: A Decade of Health Care Reform Under the Affordable Care Act," Society of Actuaries, March 2020, *https://www.soa.org/resources/research-reports/2020/50-states-50-stories/*.