I want to take my time today to talk about a spectrum of levels of epidemiology and how Covid has increased the role of faster levels in the public conversation.

I’ve plotted it out here so you can get a general idea. At the faster level, you have back-of-the-envelope estimates, which are done very quickly and just sketch the broad parameters of a question. At the slower levels, you have research that is peer-reviewed, and even research that brings together the results from many peer-reviewed articles or from having a lot of experts explore the consensus on a topic. Epidemiology at the “slower” levels tends to be well-vetted, and to provide “better” estimates, not in the sense that they’re necessarily perfect estimates, but that they bring in the best available data, the best available methods, and so on. Epidemiology at the “faster” levels won’t have this thoroughness, but it does the advantage that it can get out results much faster, even if they only give a general picture of the scale of an issue.

For a lot of us here, our work might usually focus at the “slower” end of the scale. But Covid has shown how important it is for epidemiology to happen all along this scale, including faster levels, like preprints, data journalism, and even blogs.

Of course, epidemiology has always been conducted at these faster levels. When a governor is facing a public health crisis in her state, there has always been an epidemiologist in the room trying to give a reasonable but fast analysis of the situation. When colleagues meet for coffee, there have always been chats that led to a peak at the data. What’s evolving is how public these faster analyses are. A back-of-the-envelope estimate might now become a Tweet. A chat over coffee might turn into a blog post.

Now, these public analyses were becoming more common before Covid, without question. What has changed is that, during Covid, the audience for them has exploded. This is the first year that you tell someone that you’re an epidemiologist, and they don’t ask if you study skin disease, or insects. **Everyone** has followed epidemiology this year.

In some fields, like engineering, there’s has always been an emphasis during training not just on the slower, more thorough level of analysis, but also on developing skills for faster, back-of-the-envelope assessments. As these faster types of analysis become a bigger part of the public conversation in epidemiology, we can think about how we can adapt how we train our students (and ourselves!).

There are a few dimensions that we probably need to think about. First, it is important to train students to feel comfortable doing analyses across this spectrum, including a faster analysis. A great example is this data journalism from the Financial Times. Here, they estimated how death rates had changed during Covid from **all** causes, not just Covid-coded deaths. They did that by comparing death rates from earlier years to the ones in 2020. The journalist had to decide what factors were critical to include—here, they decided it was important to compare a city with itself, and to compare within the same time of year. They also had to decide what was okay to leave out in a first, fast analysis—things like control for air pollution levels. I think they did a reasonable job of capturing an important epidemiological pattern in the time frame they had.

Second is the question about communicating uncertainty, especially with faster analyses. This was a recurring issue during Covid. One example came with preprint articles. During Covid, reporters and blogs often reported these findings, but maybe not always while communicating clearly that there was less confidence in these results than after peer review. At a broader scale, it’s really helpful if we can communicate to someone outside of science that they should have a lot more confidence in something that shows up in a consensus report, like the reports from the US Global Change Research program, compared to a quicker take in something like a blog post.

Finally, it’s important that we train students to assess epidemiology at all these levels. We certainly train them to assess the quality of a peer-reviewed article, but what about a faster analysis done by a journalist? This will be especially important because our students aren’t just headed to academia. We also have in our classrooms future journalists, future consultants, future legislators, and so on.

To wrap up, Covid has highlighted that epidemiology happens across a spectrum of speeds, and it’s shown how important it is that we are ready to conduct, discuss, and assess the evidence at all these levels.