

Preamble

Sonia Petrone, Editor

In February 2020, Annalisa Manara, a medical doctor and anaesthesiologist at the hospital in Codogno, south of Milan, Italy, had the clever intuition of testing for COVID-19 a patient whose pneumonia symptoms had taken a sudden turn for the worse. The identification of that “patient one” openly revealed that COVID-19 was already spreading in Europe; and very rapidly, the epidemic exploded in the crowded areas nearby Milan (where I live). We went from learning about a new virus following dramatic news from China, to be the first region in the western world to be violently hit by the epidemic. As a human being, and as a statistician, I felt a desperate surge of questions—how could this happen, how could we be ‘surprised’, why did we underestimate the risk so badly? Why didn’t WHO, the World Health Organization, give the alarm promptly, where was the voice of statisticians?

In Italy, since February 2020, data on the epidemic (on a regional and national basis) has been released daily, at 6 pm on television. I was surprised when colleagues in the US told me that it was not the case there. Why, in such a celebrated ‘big data’ era, was it so difficult to have reliable contagion data? Why wasn’t surveillance data available across nations and used effectively for warnings and evaluate interventions? In the emergency, what efficient sampling designs could be implemented quickly and effectively to monitor cases and guide actions? Clearly, COVID cases were largely underestimated; were we using all sources of information? In Italy, for example, family doctors had a lot of micro-information. Could (Bayesian) statisticians access and use it? I was feeling inadequate—but in fact, were we, statisticians and data scientists in the broadest sense, prepared enough? In those early days of 2020, I even found myself wondering whether our discipline(s) were actually devoting enough research to “the really important problems”—are we perhaps working too much on fine details (of inference?) and forgetting our role in fundamental problems? Wasn’t our ultimate goal to quantify risk and provide scientific evidence to those who need to take actions under risk?

The isolation we were suddenly confined to, the state of emergency we felt immersed in, the hundreds of deaths recorded in the areas around Milan, my home town, were likely making me overly pessimistic. Some colleagues, with whom I engaged in virtual discussion over the long months of the pandemic, reacted to my self-questioning of the profession noting that ‘well, there are many people generously working on COVID already, I do what I am good at’. And I see the value of this. Still, I am convinced that we must reflect on the pandemic experience—we certainly want to be well prepared next time. Another

very reasonable reaction is ‘this is politics, and politics goes beyond our role’. Indeed. And yet, shouldn’t we have a stronger voice, with a clear impact on society, international institutions, decision makers (including politicians)?

Statistical Science is not the journal to communicate our latest findings to other specialists. But I believe it is precisely the journal that can facilitate an ex-post reflection. We want to leave a trace in *Statistical Science* of this crisis and of the enormous work done by the statistical community—in its broad sense; but also reflect on lessons learned and on the challenges that call for our proactive intervention. We could hardly foresee that more than two years later we would still be struggling with COVID-19—albeit with the protection of vaccines, so rapidly developed!

The scientific response has indeed been exceptional, with impressive collaborative efforts across disciplines; such collaborative efforts will be needed to face and prevent future crisis. Scientific societies might have a crucial role, advocating to make the voice of statisticians strongly heard by governments and international institutions—such as the WHO. But we are the members and makers of scientific societies and we all are called to be proactive. For example, could we enhance our role in urging governments and institutions to a coordinated, appropriately homogeneous, and reliable data collection? Should we have a stronger voice in society? (Yes). People care a fair amount about ‘literacy’, but not enough value is given to ‘numeracy’, I feel. In the pandemic, people could not (under)stand uncertainty. Can we do more for increasing the public understanding of uncertainty and risk, through educational programs and other? (The great mathematician and statistician Bruno de Finetti wrote emphatically about the need to educate on incomplete information and risk—on *probability*...).

This special issue of *Statistical Science* is meant to offer the opportunity for discussion and reflection. These are the first steps towards further initiatives, possibly involving statistical societies, that might foster a proactive role for statisticians as we face current and new global crises. *Statistical Science welcomes the submission of further contributions, in line with the journal’s editorial policies, that strive to achieve these aims.*

I thank the Guest Editors, Chiara Sabatti and John Chambers, who responded promptly and thoughtfully to the need for reflections on the crisis and our scientific actions.