Science Magazine Policy Podcast

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Interviewer - Meghna Sachdev
Welcome to a Policy Podcast brought to you by *Science* magazine. Statistics and data analysis are the new cool kids on the high-tech block. As the sheer volume of data we collect increases, so does our need for people who can make sense of it all. I'm Meghna Sachdev and today I'm chatting with Marie Davidian and Thomas Louis, whose editorial "Why Statistics" appears in our April 6th issue. So tell me Tom and Marie, as statistics and data analysis become more visible, what are some of the most significant ways you see things changing?

Interviewee - Thomas A. Louis
I'll speculate that some positive consequences are the ability to learn more about, whether it be such things as predicting flu epidemics or social network behavior and so on, in other words, just more knowledge for a science understanding, for policy and, quite frankly, for individuals. The potential downside is that people may get concerned that there are just too many things being collected on them, and that the willingness to offer information or even to be in a context where it will be collected passively will produce a reaction against what might be, in general, social good, but will become a social neutral or negative, if in fact it isn't handled correctly.

Interviewee - Marie Davidian
Right, that's a really great point, as these massive data are collected, that's a real concern, is how do you maintain the privacy of these individuals whose data are out there? I mean if there's enough information associated with an individual it would be possible to actually identify them. And that's the concern, is how can you collect data or how can you create data sets that contain enough information while at the same time protecting the privacy of those individuals.

Interviewee - Thomas A. Louis
On the other hand, most of us are more than willing to give up every bit of information we ever could on our buying habits as long as we can get discounts from the grocery.

Interviewer - Meghna Sachdev
Great. So much data now is just made available to the general public. For example, we mentioned Google flu trends and if you use social media there are so many apps and analytics tools, and there are also infographics everywhere. But often this data hasn't really been interpreted, it's just being presented to you. Do you think there needs to be a better understanding of statistics and data for the public to really get much good out of things like this?

Interviewee - Thomas A. Louis
Well I have an easy answer, it's very important to have public understanding not so much of anything you call mathematical statistics but of the broad concepts of statistics, the sampling issues, the bias issues, and to kind of at least have a mental checklist that they should ask of anything, whether it be a graph or a table before they just believe it wholesale.

Interviewer - Meghna Sachdev
And what are some of those things that you should ask?

Interviewee - Marie Davidian

Well, having a little bit of skepticism is good! How were the data collected? For example, information that may have been missing, how was that dealt with? How were the graphics produced? Anything that could have been done to the data in order to prepare them for the nice, neat graphic could possibly bias the conclusions drawn from it.

Interviewee - Thomas A. Louis
And I'll just add thinking a bit about the uncertainty in what is embedded in the analysis. For example, a public opinion poll might say '60% of the people favor candidate A.' The first thing someone should think about when they're looking at that is, is the sample representative of the population that's being surveyed, but also is this 60% based on 6 people out of 10, or 600 out of a 1000?

Interviewer - Meghna Sachdev
Well, that all sounds very useful! Is there anything else either of you would like to add?

Interviewee - Thomas A. Louis
On a personal note, I think it's now that I will admit 45 years, if it starts with graduate school, that I've been involved with statistics, and I just, I love it! Because I love the ability to get deeply involved in what we hope are important projects that have influence on either patient's health or public policy, and also find issues in those applications that require novel approaches that will not only help in that application, but help elsewhere, and that back and forth is just really fun and exciting.

Interviewee - Marie Davidian
Mm-hmm. One of the unique things about this field is the opportunity to get involved in so many different things. Over the course of my career I spent six years doing nothing but working with agricultural and life scientists, I've also worked with pharmaceutical scientists on things like pharmacokinetics, I've been able to work, more recently, with clinical scientists, from cardiologists to oncologists. So, the opportunity to get involved in so many different areas of science, for me, has really made this, as Tom said, just fun. I love what I do!

Interviewer - Meghna Sachdev
Marie Davidian and Tom Louis, thank you very much. Read Marie and Tom's editorial in *Science* this week. I'm Meghna Sachdev. On behalf of *Science* magazine and our publishers, AAAS, thank you for joining us.