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# **The Disciplined Nature of Science**

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A scientific report published on June 24, 2021, in a renowned international journal (“Vaccines”) was accessed online by over 400,000 readers in a short span of 10 days. That is 40,000 readers per day on an average. This is likely a world-record. The study was carried out by three scientists from institutions in three countries, Poland, Germany and The Netherlands. However, four days after its publication, the journal issued an “expression of concern” to alert readers to significant concerns regarding the paper. The journal initiated an investigation and agreed to “provide an update following the conclusion of our investigation.” What followed is dramatic! The journal officially retracted the publication on July 2, 2021, because the editorial investigation revealed that there was “misrepresentation of the COVID-19 vaccination efforts and misrepresentation of the data.”

As a matter of fact, drama started immediately after the paper was published. One after another, scientists who were associate or section editors of the journal started to resign. I have never seen such a phenomenon in my scientific career spanning over four decades. “Vaccines” is a very respectable journal, published by a well-known publisher – Multidisciplinary Digital Publishing Institute (MDPI), Switzerland.

What was this paper all about and what were the issues? The paper stated that “COVID-19 vaccines have had expedited reviews without sufficient safety data. We wanted to compare risks and benefits.” Usually, it takes a long time to assess various aspects of a new vaccine, most importantly safety to the individual recipients of the vaccine based on data collected from a large number of persons who are provided the vaccine, before it is launched. During the pandemic, the new vaccines were rolled out in a hurry with some assessment, but not as detailed as done under normal circumstances, of their safety and efficacy.

The authors used data from two large data sets (Israeli and Dutch), and concluded that “For three deaths prevented by vaccination we have to accept two inflicted by vaccination. This lack of clear benefit should cause governments to

rethink their vaccination policy.” Scientists went ballistic on reading this. Of course, if the data supported this conclusion, then there was worry. But, the data did not. The study was flawed, among other issues, because the authors assumed that every death that occurred after vaccination is because of the vaccination. This obviously is not true. Especially because many vaccine recipients have co-morbidities, such as uncontrolled diabetes, especially because the vaccine doses are being preferentially provided to the elderly.

This episode is both to be decried and to be celebrated. Decried because the authors did not use the critical methods of modern science to arrive at the conclusions. Celebrated because science is self-correcting. Even if by use of drastic measures by scientist peers, as in the present instance.

Incorrect conclusions drawn by scientists can impact the civil society very adversely. Vaccine hesitancy is a major problem in controlling the spread of the SARS-CoV-2 coronavirus. Vaccines are a sure way to prevent spread of the coronavirus. If a substantial proportion of a population is vaccine hesitant, then the coronavirus will continue to circulate in the population. The more it circulates, the greater is the chance that it will change its character and become more ferocious, as we are seeing with the Delta variant. Vaccine hesitancy generates primarily from fear and misinformation. Much has been written about vaccine hesitancy in India. The proportion of hesitant persons is quite variable across populations, and can be as high as 20%. Incorrect conclusions of studies undertaken by scientists can fuel vaccine hesitancy emphatically. In India, such incorrect conclusions can be a double whammy. There is already considerable dearth of vaccine doses in our country and any addition to vaccine hesitancy will further increase the circulation of the coronavirus. Fortunately, the self-correcting nature of science prevents the spread of incorrect information, as in the case of the present retraction.