

Germ Theory

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I write this from Sag Harbor, New York, anxiously awaiting our 91st Annual Scientific Meeting in Denver in 2 weeks. My fondest hope is to get through the meeting without more adverse impacts from COVID. Despite Zoom and other virtual meeting platforms, I personally think these wonders of technology just do not allow for the same depth, spontaneity, fluidity, and multilayered nuances of in-person human interaction. We'll see how this all works out and figure out what we missed without everyone there.

As mentioned in last month's President's Page, the theme this year is *Scientia ex Machina* or "Knowledge from the Machine." How will technological advances impact the role of humans in aviation and space, the field of aerospace medicine, the meaning of human performance, and how will this alter the aerospace medicine community, practice, and research? To me these questions will continue to be top-of-mind for AsMA for the foreseeable future.

Paralleling the influence of information technology on evidence-based science and research in advancing aerospace medicine, we may need to pay special attention to how the ebb-and-flow of politics and individual/public opinion could potentially influence or alter AsMA's areas of interest and expertise. Which raises the question "How does any organization keep a weather-eye on changes that are beyond the time horizon without any available way to accurately see over the horizon?" It's more than a question of the continuing relevancy of the organization, but also identifying potential rocks-and-shoals that may shipwreck an organization's cherished future-scapes from fruition. Yup, back to gap analysis of strengths vs. weaknesses and threats vs. opportunities. In the words of another Sag Harbor-ite, Billy Joel, "... if I go cold I won't get sold, I'll get put in the back in the discount rack like another can of beans." (No, don't know him and haven't met him, although my wife and daughters have.)

Perhaps COVID provides some object lessons for AsMA as an organization. Back in late 2019, it was unclear if COVID was just another seasonal corona virus that might turn into a pandemic. With spread internationally, risk mitigation actions between and within countries was not consistent or fully coordinated but did produce dramatic financial and employment effects worldwide. Once it became clear that COVID was a pandemic, the obvious optimal prevention strategy was vaccine development and

administration to reduce threats to individuals and the strain on economies and healthcare resources. The mantra was "follow guidelines to reduce risks to you and your communities until the vaccines are here." Now that

vaccines are here and widely available in many developed countries, significant parts of those populations are hesitant or refuse to get vaccinated. For scientists, it is galling that the product (vaccines) of the best research and innovations garnered from technology unimaginable just a few decades ago is rejected or discounted for any number of rationales. We've seen politicization, evening news theatre, and social media mania drive skepticism or simple contrariness that have become real detriments to the well-being of many people. As of August 10, the United States, United Kingdom, and Netherlands have been forced to destroy expiring vaccines due to lack of demand and "vaccine hesitancy." This at a time when many countries worldwide have extremely low vaccination rates due to lack of availability. Why is this? To the usual suspects of economics and supply chain issues, preventive medicine organizations must address vaccine hesitancy and the more extreme germ theory denialism.

I asked the "machine" (Google, Bing), expecting to readily find estimates on the numbers of websites or blogs promoting these thoughts, but no joy. However, there is good information on the prevalence of vaccine hesitancy or being "unsure" at [Vaccine Hesitancy for COVID-19 | Data | Centers for Disease Control and Prevention \(cdc.gov\)](https://www.cdc.gov/data/vaccine-hesitancy-for-covid-19/). Great graphics map rates of hesitancy across the United States ranging from lows of 1.86-4% up to highs of 14-18%. The National Foundation for Infectious Diseases ([Key Actions To Promote Vaccine Acceptance – National Foundation for Infectious Diseases \(nfid.org\)](https://www.nfid.org/)) noted that "despite all the evidence of safety and effectiveness of currently recommended vaccines, vaccine hesitancy has become a global problem. The World Health Organization (WHO) has listed vaccine hesitancy as one of the top 10



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threats to global health. Vaccines have become victims of their own success, with many parents no longer fearing the diseases vaccines were designed to prevent. Unfortunately, misinformation about vaccine safety is widely promulgated, largely through the internet and social media." I was not able to find any estimates of the percentage of the populace in the United States that denies germ theory. I bet more than we would imagine.

Getting back to AsMA, what lessons from COVID? The issue seems to be that most people have short memories for bad or tragic events not personally affecting them, but have long memories for compelling fictional tales. Add the questions "what have you done for me lately?" and "what can you do for me in the future?", and we have perhaps four quadrants of issues AsMA needs to face as we endeavor to tell our story.