GUEST Editorial

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Imagining Sisyphus Happy–Redux

This is the seventh of a 12-part series: This year we're focusing on the phenomenal progress that the medical community has made in the 30 years of Federal Practitioner's *existence. Each month we'll feature an editorial written by one of our Editorial Advisory Association members, reminding us how much has changed in their particular medical field over the past 30 years. This month's focus is infectious diseases.*

The cover of the May 2013 edition of *Emerging Infectious Diseases* offered an appropriate analogy to reflect on the advances in infectious disease medicine over the last 30 years and to put in perspective those accomplishments against current and future challenges. The artwork portrayed Titian's masterpiece of Sisyphus toiling with the never-ending burden of pushing the stone up the hill as punishment for cheating death. Polyxeni Potter provided an accompanying editorial comparing Sisyphus' endless journey to public health efforts to understand and battle against emerging and reemerging infectious diseases. Ms. Potter draws on the final chapter of *The Myth of Sisyphus* by Albert Camus that in public health one must imagine Sisyphus happy as the struggle itself is enough to fill one's heart.[1] Potter concludes, "…and in public health, where monumental effort sometimes brings incremental improvement, success is still measured by tying up Death."[2]

The last 30 years have seen a number of significant advances in the understanding, prevention, and treatment of infectious diseases. Unfortunately, the world of infectious diseases is far from static, and new threats emerge or old threats evolve faster than available countermeasures. Describing the many significant advances in infectious disease medicine (as well as the numerous new threats) would occupy volumes. Moreover, several journals exist for the specific purpose of describing advances in infectious diseases. However, it is worthwhile to describe a few key advances as well as to discuss the lessons learned over the last 30 years and to put in perspective some of the challenges and opportunities available for federal practitioners.

First, a short disclaimer. I am not an infectious disease researcher or clinician. I have an enviable position of supporting the infectious disease clinical research enterprise through helping researchers navigate through the regulatory matrix with the least burden possible. As such, I have the opportunity to work with clinical researchers who are surrogates for Sisyphus with every hypothesis geared toward answering questions that advance our understanding of respective infectious diseases resulting in the need to continue their struggles to answer the subsequent questions generated by their findings. I have the good fortune of currently working with many highly skilled and truly dedicated clinicians and researchers in the National Institute of Allergy and Infectious Diseases (NIAID) and had the opportunity of gaining experience with a similar group in the DoD while serving in the U.S. Army Medical Research and Materiel Command. It is from the work of these many experts that I have gained some appreciation for the advances and challenges of infectious disease medicine.

Advances in public health programs took the U.S. death rate from 797 per 100,000 in 1900 to a low of 39 per 100,000 in 1982. Improvements in sanitation, water, standard of living, vaccination, and the development of antibiotics had much to do with the tremendous reduction seen during that 8 decade run. Since the early 1980s, the emergence of the human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS), the development of resistance to antibiotics, and the emergence of new threats have conspired to limit the opportunity for additional reductions. Moreover, while the situation in the U.S. is somewhat stable, the situation abroad is far different. Geo-political

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realities and the multimodal nature of international transportation compel all of us to recognize that infectious disease threats across the globe impact all of us in this increasingly interconnected world.

On the plus side, the full-court press applied to the emergence of HIV/AIDS resulted in the reversal of a universally fatal outcome to that of a chronic, albeit a serious, illness that is manageable with medication. The development of highly active antiretroviral therapy (HAART) that is relatively convenient to take has made living with AIDS a reality for millions. Additionally, the President's Emergency Plan for AIDS Relief has made headway in addressing the availability of medication on a global basis. Moreover, several prevention strategies focused on educating the public as well as making condoms and circumcision available have stemmed the tide in HIV acquisition.

Also, the spike in hepatitis C infections resulted in a substantial response from the research community. The growth of available effective treatments has expanded substantially, resulting in the capacity to clear the virus in many patients. Vaccines to prevent hepatitis B, hepatitis A, *Haemophilus influenzae* type b, human papillomavirus, Lyme disease, rotavirus, and a nasal influenza vaccine have all been introduced in the last 30 years. Basic science advances in the genomic and proteomic underpinnings of bacterial and viral processes as well as host susceptibility have opened the door for applied sciences to move the field further ahead in the next generation.

Regardless, the uphill struggle continues. As pointed out by NIAID Director Anthony Fauci, "If history is our guide, we can assume that the battle between the intellect and will of the human species and the extraordinary adaptability of microbes will be never-ending."[3] Challenges such as methicillin resistant *Staphlococcus aureus*, multidrug and cross-drug resistant tuberculosis, emerging infections such as the novel Middle East respiratory syndrome coronavirus, bird-to-human influenza transmission in China, sporadic outbreaks of chikungunya, Marburg, and Ebola viruses as well as the always present threat of malaria and dengue fever throughout most of Africa, parts of Asia, and South America continue to overwhelm health care systems and perplex practitioners and researchers. Added to this burden are those diseases resulting from inadequate sanitary conditions leading to cholera and bacterial diarrhea. Moreover, while AIDS treatment allows patients to live nearly normal lives, the long-term effects of prolonged therapy with HAART, such as the increased incidence of atherosclerosis, continue to push the research community to discover a cure as well as an effective vaccine. And for diseases for which childhood immunizations are effective, poorly informed information campaigns have inappropriately scared away parents from making appropriate vaccination decisions for their children.

Practitioners and researchers in the federal sector are in the forefront of the struggle. The unique capabilities of the various agencies when used through a coordinated and collaborative effort, especially when working with nongovernmental organizations such as the Gates Foundation and willing industry partners, can be a formidable force. Whether it be the infectious disease physician consulting on cases in the health care setting, the researcher at the bench or in the field, or the public health information specialist developing messages to advocate for appropriate adherence to vaccination schedules, we all have a place in pushing the stone forward—and perhaps imagining ourselves as happy doing it.

Author disclosure

The author reports no actual or potential conflicts of interest with regard to this article.

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