



Wake Up: COVID-19 Is Just a Modern-Era Prequel of What Could Come Next

Deadliest Enemy: Our War Against Killer Germs. By Michael T. Osterholm and Mark Olshaker; Little, Brown, Spark (Hachette Book Group); New York, New York; 2017, paperback edition May 2020; ISBN 9780316343756; pp 346; \$ 17.99 (paperback)

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Humanity has but three great enemies: fever, famine, and war; of these by far the greatest, by far the most terrible, is fever.

—Sir William Osler, M.D. (p. xiii)

The microbe that felled one child in a distant continent yesterday can reach yours today and seed a global pandemic tomorrow. How can we procrastinate any further, or have any reservations, about a common cause—one that responds to every outbreak of disease anywhere as a challenge to all of us.

—Nobel Laureate Joshua Lederberg, Ph.D. (p. 24, [1])

We were all surprised and shocked when COVID-19 hit us last year, not only by the experience of the first real pandemic of our times, but also by the complete lack of preparedness of society and governments for a catastrophic event of this magnitude. However, as the authors of *Deadliest Enemy*, Michael T. Osterholm, Ph.D., M.P.H., and Mark Olshaker, write in the preface to the 2020 paperback edition of the book, this pandemic should not have come as a surprise to any of us. They add, “Nor should the next one; and rest assured, *there will be a next one*, and one after that, and on and on. ... one of them will be even bigger and one or more orders of magnitude more serious than COVID-19” (p. xv).

In contrast to the US government and media, Osterholm and Olshaker view infectious diseases as the greatest threat to

national security. Their book presents their argument and explains it lucidly, with a great amount of supportive evidence. This book is relevant to academic psychiatrists, as the COVID-19 pandemic, in addition to having physical health consequences, has been very stressful to our patients, our trainees, and us personally, as will be any other potential medical catastrophe of this size and consequences.

The first six chapters present a backdrop that provides context for the rest of the book. Chapter 1 brings back the story of acquired immunodeficiency syndrome (AIDS), for many now either unknown or forgotten. Some may still remember how terrifying it was, especially for the gay population. Researchers found the cause, figured out some preventive measures, and discovered effective treatments. Yet, treatments today are only able to control this disease, “just as we do with diabetes and other chronic diseases, not *prevent* or *cure*” (p. 17). After 40 years of research, we still do not have an AIDS vaccine. That is the first strong warning: there are infections, deadly ones, for which we will likely never be able to produce vaccines.

Chapter 2 explains the role of epidemiology and public health, emphasizing that the public health sphere is always trying to “*replace* bad deaths with good deaths; to prevent early and needless death and disease” (p. 25), and the role of epidemiology is to prevent diseases and, if that is not possible, to minimize disease and extended disability. The fourth chapter focuses on “The Threat Matrix,” a graph that shows “what we should be worrying about” (p. 49). The text outlines some of the elements of unpreparedness and lack of planning. Especially relevant here is the quote of President Dwight D. Eisenhower: “In preparing for battle, I have always found that plans are useless, but planning is indispensable” (p. 51). The authors remind us that we live “in a just-in-time-delivery economy where virtually nothing is warehoused for future

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sales, let alone stockpiled for a crisis situation” (p. 53). The chapter concludes with what the authors call a *Crisis Agenda*, which includes controlling microbes that can trigger a pandemic, prevention of high-impact regional outbreaks such as Ebola or coronavirus (!) infections (remember, this was written in 2016–2017), and prevention of the use of microbes for intentional harm. The sixth chapter contains a discussion of the New World Order, which brings to our attention what we noticed during COVID-19, that “virtually all of our generic lifesaving pharmaceuticals are manufactured overseas” (p. 69).

The following two chapters address means of transmission of infections (Chapter 7 is aptly titled “Means of Transmission: Bats, Bugs, Lung, and Penises”) and the best tool we have in fighting pandemics, vaccines. Vaccination has been used for a long time, even during the War for Independence, when General George Washington mandated smallpox inoculation for the entire Continental Army (p. 81). The development of new vaccines has been slowed by complacency and the antivaccination movement. In addition, the development of vaccines is a costly and complicated process. (Not everybody is in it for money, as the answer of Jonas Salk, the developer of the first polio vaccine, to the question of who owns the patent on polio vaccine, suggests: “Well, the people, I would say. There is no patent. Could you patent the sun?” [p. 83].) Pharmaceutical companies, in all fairness, would like to do the right thing, but they focus instead on medications for chronic diseases that bring steady income rather than on vaccines that take decades to develop and cost billions yet may not be used (p. 85). As the authors write, “We need a new paradigm – a new business model that pairs public money with private pharmaceutical company partnership and foundation support and guidance” (p. 91). We have seen this in a way with the development of the COVID-19 vaccine, but this process was reactive, not preventive.

Starting with Chapter 9, the authors organize the book in ascending order of the crisis agenda priorities, with the top two threats being antimicrobial resistance and a new, much stronger influenza pandemic. They start with reviewing malaria, AIDS, and tuberculosis (TB)—big killer infections without vaccines. It seems that TB is almost a forgotten disease, yet “the combination of TB and HIV becomes an infectious-disease perfect storm” (p. 109), with HIV compromising the immune system and thus allowing TB to spread freely. As the authors point out, we are terrified of Ebola, but ignore TB, yet “TB is a much more likely large-scale killer in the West than Ebola or Zika” (p. 109).

The next chapter is even scarier, as it discusses gain-of-function research of concern and dual-use research of concern, the first being “an intentionally created mutation through one of several methods, which gives the microbe new functions or abilities,” and the latter, “life-science research that could be directly misapplied and pose a significant threat to public

health and safety” (p. 112). Modern techniques allow scientists to become real Frankensteins (p. 111) and reconstruct, for instance, the 1918 influenza pandemic virus (p. 116). Tagged on is a chapter on taking this research to the even more dangerous area of bioterrorism. Again, we are reminded of the lack of preparedness and lack of attention to these threats, with quotes from a 2015 report titled *A National Blueprint for Biodefense*, including, “There is no centralized leader on biodefense. There is no comprehensive national strategic plan for biodefense. There is no all-inclusive dedicated budget for biodefense” (p. 140).

The following chapters deal with the lessons of Ebola, SARS (Severe Acute Respiratory Syndrome), and MERS (Middle East Respiratory Syndrome) as harbingers of things to come; the role of mosquitoes, which are called “public enemy number one” (with a lovely quote from the Dalai Lama on page 178: “If you think you are too small to make a difference, try sleeping with a mosquito”), and the Zika epidemic.

As if the reader is not disquieted enough, the next couple of chapters deal with another serious issue, the development of resistance to antibiotics among various microbes and the possibility of a post-antibiotic era. The authors discuss the importance of curbing the use of existing antibiotics (e.g., inappropriate use in humans, use in animals) and make another strong appeal for the development of new vaccines. This information is followed by a chapter on what Dr. Osterholm sees as the biggest threat, another pandemic, which is most likely to come in the form of a deadly influenza strain. He argues that influenza is hyperevolving and that our present vaccines for influenza are inadequate, with most of them being much less efficacious than has been claimed year after year.

The final chapter comes back to the alarming discussion of the introduction and presents “the battle plan for survival.” The authors argue that a Manhattan Project–like program is needed to secure a game-changing influenza vaccine and vaccinate the world, establish an international organization to address all aspects of antimicrobial resistance, recognize that TB, HIV/AIDS, malaria, and other life-threatening infections remain major global health problems, anticipate the effects of climate change (“Think of infectious diseases as fire and climate change as fuel,” p. 308), and create an agency or organization that would lead the fight against infections.

The authors are skeptical about the role of the World Health Organization and propose that the world “will have to realize a new level of public health leadership, organization, and accountability that will involve governments, the private sector, and philanthropic and nongovernmental organizations” (p. 310). As Osterholm and Olshaker write, all resources in the world will not achieve much “without leadership, accountability, and an effective command-and-control structure” (p. 311), and thus, they propose the creation of an organization similar to the North Atlantic Treaty Organization

to respond to infectious disease crises (p. 315). They also advocate for the creation of a Department of Public Health for addressing the domestic agenda in fighting infectious diseases (e.g., the USA created the Department of Homeland Security in response to the events of September 11, 2001). We have been able to see how much we needed such an agency during COVID-19, and we can only imagine how much a well-funded and well-running agency could have done and could accomplish in the future. As emphasized in the 2020 introduction of this edition, leadership and information to the public during a public health crisis should be provided by health experts, not agenda-oriented political operatives (p. xvi). Furthermore, the USA can no longer afford dependency on other countries in manufacturing life-saving medications but has to invest in manufacturing old medications and developing new medications within the USA. The United States spends billions of dollars on national security and defense, yet its funding of the greatest national security threat—infectious disease—is minimal. The country has lost more lives due to COVID-19 than in any war but the Civil War and is getting close to overcoming even that number (620,000 lives were lost during the Civil War and about 600,000 deaths have occurred from COVID-19 as of this writing).

As Osterholm and Olshaker write, “The government, industry, the media, and the public never take the prospect of another microbial threat seriously enough” (p. xxi). One would expect a serious debate on what is the next step as COVID-19 seemingly comes to an end in this country. That debate does not appear to be happening, at least publicly, despite the expertise of people like the White House Chief of Staff Ron Klain, who was Ebola czar under President Obama. There is an ongoing debate about what to do with the COVID-19 relief money, but no public discussion about

using this money to build up the public health infrastructure. It is quite possible that like AIDS, Zika, and other infections, COVID will be almost forgotten, with only small reminders in the form of yearly vaccinations. But the next pandemics are coming, and we will not have vaccinations for every microbe.

We have been reminded about the dangers of infectious diseases and pandemics in various books, movies, and articles (e.g., [2]) over the decades. Yet, we still do not have any plan. This book aptly (though wordily—my only criticism) summarizes the problem and presents a coherent proposal. It is up to us as a society to use it. This book is important for all of us to read, especially in the context of what we have been through during the last year and a half or more. We need to wake up before the next pandemic arrives. Is it possible?

Declarations

Disclosure The author states that there is no conflict of interest.

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