

The Antibiotic Paradox: a short review

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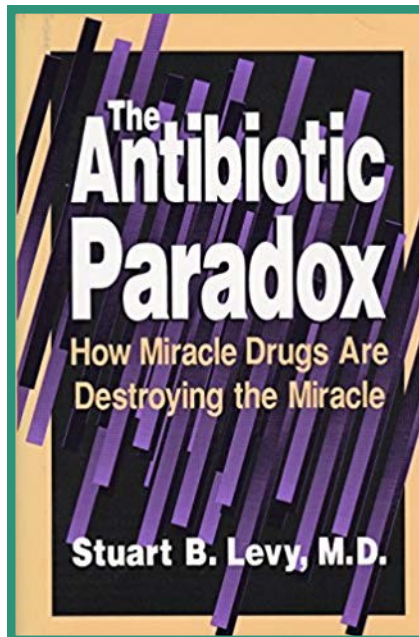
In 1992, Stuart Levy published *The Antibiotic Paradox: How Miracle Drugs are Destroying the Miracle*. (New York: Plenum Press). I am privileged to write this review using my copy, signed by Prof. Levy himself in 1997 when we first worked together. In his preface he wrote, “Antibiotics have been called the single most important therapeutic discovery in the history of medicine... While to some extent antibiotics have merited this appellation, it paradoxically has caused some dent in their armor... leading to their misuse and overuse. Bacteria have responded to the widespread applications of antibiotics finding ways to become resistant, insensitive to the killing effects of these powerful drugs.”

Prof. Levy spent most of his career studying, educating and sounding the alarm on the misuse and overuse of antibiotics and the calamitous effects that this misuse/overuse brings, namely antibiotic resistance. Through numerous scientific papers, lectures, consultations and the founding of a visionary professional organisation, the Alliance for Prudent Use of Antibiotics (APUA) in 1981, Prof. Levy devoted his life to this cause. Nowhere in his writing, however, can his voice be heard more clearly than in his book, *The Antibiotic Paradox*.

In the book, one can read his discussion of the history of the development of antibiotics, the proliferation of antibiotic resistance and discussion of overuse of antibiotics, which remain as valid today as when they were first published. In 2002, he published *The Antibiotic Paradox: How the Misuse of Antibiotics Destroys Their Curative Powers*. In its second edition, he updated information that was originally presented in the first edition. The updated edition also included steps that the public, the pharmaceutical industry and various health care organisations can take to control the problem of antibiotic misuse and resistance.

Prof. Levy was deliberate in his writing approach in the book to educate a wide audience, not just healthcare professionals. In readable, straightforward prose, he described the development of antibiotic resistance, the

genetic components in its proliferation, and the role antibiotic pressure plays in the selection of resistant bacteria in plants, animals and humans. He spent several chapters explaining how the millions of pounds of antibiotics used in veterinary medicine, agriculture and aquaculture, which are the bulk of antibiotics produced in the United States, facilitate the selection of resistant microorganisms. Many people believed the animal and human ecospheres were separate and the development of antibiotic resistance in one sphere would not affect the other. Prof. Levy provided many examples of how animal-associated resistant strains eventually infected human beings, some from Levy’s own work. The morbidity associated with these infections is significant, and the costs of treatment are staggering.



Through the educational efforts of many including Prof. Levy, in part from *The Antibiotic Paradox* publication, the use of antibiotics in feed has slowed, due to developing alternative techniques to promote growth in animal husbandry. This has lessened the development of resistant microbial strains, though much work remains worldwide.

Prof. Levy’s legacy may be difficult to characterise but his book, *The Antibiotic Paradox*, certainly should be included in that legacy. He described the founding of APUA in the book as “an internationally-based group whose membership extends to more than 80 countries of the world, communicates basic tenets of proper antibiotic usage and the problems of antibiotic resistance.” He thought it essential that APUA act “outside of political and economic pressures. Its members are individuals, doctors, dentists, pharmacists, veterinarians, biologists, microbiologists, public health officials and others whose professions include handling antibiotics directly or confronting resistance in the home, hospital or laboratory—making people all over the world cognisant of the resistance problem.” Prof. Levy has helped the world achieve that awareness so that, in his words, “We could then control the rise of antibiotic resistance and assure the success of antibiotics now and for generations to come.” Now is the time for all of us to carry on Prof. Levy’s work.