Disasters


To increase our awareness of the significant human losses associated with disasters throughout the world, the United Nations declared the 1990s the International Decade for Natural Disaster Reduction (IDNDR). As part of the response to the United Nations initiative, editor Dr Eric Noji, with 15 other contributors, has developed a major reference text on public health and disasters.

The Public Health Consequences of Disasters is a significant update to the 1989 monograph by the Centers for Disease Control and Prevention (CDC) on the same subject. As with the earlier monograph, many of the contributors have had extensive medical and public health experience related to recent disasters in both national and international settings while serving as physician-scientists or public health professionals within the CDC.

Following the approach used by Dr Michael Gregg, who served as editor and contributing author of the 1989 CDC monograph and who provides the foreword to this text, Dr Noji divides the 20-chapter book into four main sections: general issues, geophysical events, weather-related problems, and human-generated problems. While 15 of the chapters provide additional and more current information on topics previously covered, new chapters present timely and authoritative information on other important issues, such as environmental health, mental health, epidemiologic methods used to study disasters, and descriptions of acute situations affecting large civilian populations (complex emergencies).

The introduction and first two chapters, which cover the nature and general characteristics of disasters and the relatively new field of disaster epidemiology, are well written by Dr Noji and provide an excellent primer to the rest of the text. Noji indicates that the public health reviews throughout the text emphasize an epidemiologic approach and present a common theme: that the public health consequences of disasters can be eliminated or greatly reduced by implementing effective prevention and control measures. I found that these stated objectives were definitely achieved. Readers will most certainly want to venture beyond the introductory sections, however, since the following chapters have something for everyone.

Having served as an environmental epidemiologist in a state health department for almost 15 years, I was particularly interested in learning more about the natural and human-made disasters that have occurred throughout the United States and their impact on human health. I was not disappointed. Many authors provide comprehensive reviews of major natural disasters that frequently occur, such as floods, tornadoes, hurricanes, and earthquakes, and the associated mortality and morbidity patterns. They also provide important recommendations and practical advice, such as known health risk factors associated with specific disasters or available educational materials (for example, CDC pamphlets on specific disasters such as hurricanes and floods). I was fascinated by Dr Peter Baxter’s review on volcanoes, as I learned that there are numerous volcanoes in the western United States, Alaska, and Hawaii. Two volcanoes, Mauna Loa in Hawaii and Mount Rainier in Washington, are included on IDNDR’s listing of “Decade Volcanoes,” which require special study. The health threats associated with volcanoes are well covered, with a special focus on lessons learned from the 1980 Mount St Helens eruption. For those with an interest in international health, several chapters, such as reviews by Dr Michael Toole on complex emergencies and Dr Ray Yip on famine, provide excellent insights into the devastating public health consequences associated with recent international disasters.

Although Dr Noji states in the introduction that the book cannot cover all areas of emergency response and preparedness, I would have enjoyed seeing some review of terrorist emergencies (for example, the 1995 Oklahoma City bombing) and transportation disasters (eg, airline crashes). Dr Edwin Kilbourne’s chapters on hot and cold environments give excellent practical examples of how normal seasonal events can result in significant public health emergencies. My one suggestion is that the chapter on cold environments be expanded in the future to include potential adverse effects related to blizzards and other snow emergencies. As I read Noji’s chapter on earthquakes, I noted that entities considered under morbidity and mortality could also apply to nonearthquake emergencies, such as the collapse of buildings due to acts of terrorism. A major strength of the book, in fact, is the applicability of medical and public health information and recommendations from any given chapter to other areas.

Many physicians at the local level will find this book directly relevant to their practices. Specific chapters, particularly those on flooding, hurricanes, tornadoes, and hot and cold environments, will certainly increase practicing physicians’ level of awareness of potential health threats for their patients due to normally recurring events in certain high-risk areas. For other physicians, public health professionals, and all others who have an interest in the medical and public health implications, The Public Health Consequences of Disasters is an outstanding desk reference. I recommend it wholeheartedly and without reservation. It is a fascinating book, which will serve as an authoritative source of information for many years to come.

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Vesalius


...few disciplines are more surely based on the work of one man than is Anatomy on Vesalius.1

Andreas Vesalius of Brussels is acclaimed for three towering publications: Tabulae anatomicae sex of 1538, De humani corporis fabrica libri septem of 1543 and 1555, and the Epitome of 1543. With the brashness of Icarus, yet borne aloft on wings of genius, he penned the preface to the Fabrica: “I am aware that by reason of my age—I am at present twenty-eight years old—my efforts will have little authority, and that, because of my frequent indication of the falsity of Galen’s teachings, they will find little shelter from the attacks of those who were not present at my anatomical demonstrations.”

Cavanagh’s full folklore recreation of the original artwork of the 14 Vesalian
muscle men of the second book of the Fabrica is not only a tribute to the heights of beauty but also a great technical achievement. I’m sure that the idealistic Cavanagh spent a considerable sum for these stunning reproductions, in the same way that the artist Calcar paid from his own pocket for some of the Vesalian output.

This review will not consider the substance or technique of the landscape backgrounds to these figures; I leave that task to others who know more about art. However, I agree with Cavanagh that the landscapes give a sense of reality and perspective to these magnificent anatomical figures. Far from the “Dance of Death” that Putscher (as quoted by Cavanagh) named the ensemble composition, here is a celebration of muscular organization and coordination. Cavanagh points out the “good marching order” and “splendid effect.” Viewing these figures, I hear not only triumphant martial strains, but also melodious ballet music. By all means, this is an “admirable vision,” recalling the poem of Paine:

Beyond the last horizon’s rim,  
Beyond adventure’s farthest quest  
Somewhere they rise, serene and dim,  
The happy, happy Hills of Rest.3

Much speculation surrounds the design and engraving of this work. Kemp credited Calcar with the Vesalian muscle men. Petruccelli reported Vasari’s contemporary support (1568) of Calcar as the artist of the illustrations of the Fabrica, but not the Tabulae anatomicae. Guerra supported the idea that Calcar was the designer and da Forli the engraver. My superficial historical knowledge tells me that this great glory should perhaps be shared by both men, but surely the greatest merit should go to the designer, Jan Stephan van Calcar. Wershub also mentions “the best printer,” Opornus of Basel. Thankfully, it is not within the mission of this review to solve the problem.

In the Venesection Epistle of 1539, Vesalius wrote: “Wherefore, if there are opportunities of obtaining bodies, and if Jan Stephan—the most illustrious painter of our time—does not refuse his services, I, on my part will by no means shun the task.” There is no question in my mind that Vesalius, with his passion for correctness in anatomy, was involved in the organization and presentation of the muscle men. It is my opinion that Vesalius advised the artist how to proceed, perhaps even choreographing the figures himself. Muscles are seen in action, strutting, performing a machine of muscle that only God could create.

“Vesalian muscle men”

In plate I of the portfolio, a lateral projection, the muscle man is marching. The dissection is superficial, with excellent muscle demonstration. Plate II is an anterior view with removal of skin and superficial fat. Here the muscle man is perhaps praying.

There are problems with plate III. According to Vesalius, it “demonstrates the anterior view of the body, and it differs from the first plate of the muscles in that it shows the muscles of the fleshy membrane (membrana carnos) and also several of the facial muscles” [Fabrica II:26:i]. Richardson and Carmel brilliantly laid bare the subtleties of Vesalius’s Latin style and vocabulary, cautioning that “even a minor slip here can easily distort a careful piece of research or exposition and turn it into error or even absurdity.” That said, I confess to not understanding this “fleshy membrane.” Saunders and O’Malley considered it to be the deep fascia. Or should we follow Kemp, who places this anatomical entity “above the major muscles”? I venture, without any assurance, that it is perhaps the epimysium, the innominate fascia covering the external oblique muscle.

In plates IV through VIII, Vesalius presents anterior views of the deep muscles of the human body, some of which are removed for better demonstration of the underlying layers. In plate V, the rectus abdominis reaches the clavicle, and a nonhuman muscle is shown at the anterior neck. Why? I agree with O’Malley that these “errors” may have been purposely executed to highlight the differences between the Vesalian demonstrations and the prevailing Galenic dogma combined with animal dissection. A similar “mistake” occurs in plate VI, where the scalenus anterior muscle is extended below its insertion on the scalene tubercle of Lisfranc on the upper surface of the first rib. Plates IX through XIV demonstrate the deep and superficial musculature of the back.

I strongly advise every medical doctor and researcher to buy these Vesalian muscle men and to hang them in his or her office. Every medical library should also own this striking portfolio. After all, we would then be the proud possessors of a limited edition of the “most important of all illustrations in the history of medical science,” “its greatly admired plates are still a delight to behold.”

Vesalius died in October 1564 and was buried on the beautiful Greek island of Zakynthos (Zante) in the Ionian Sea. If he but knew of the continuing rape of gross human anatomy in our days, surely he would be turning over in his grave! Perhaps Vesalius was not only commenting on his own times when he wrote, “As things are now taught in the schools, with days wasted on ridiculous questions, there is very little offered to the spectators that could not better be taught by a butcher in his shop.”

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From The Panorama of Vesalius, plates I-XIV.
Error and Judgment


This book demonstrates the value failure has in achieving success. Written by an engineer, the chair of the Department of Civil and Environmental Engineering at Duke University, it illustrates principles as important to the successful practice of medicine as they are to engineering. The book comprises case histories of engineering failures, dating back to the first century BCE. The most dramatic examples are bridges that collapsed and ships that sank; the most recent is the 1981 collapse of an interior walkway of a large Kansas City, Mo, hotel in which more than 100 people died. The importance of the case histories, aside from their historical interest and the beauty of nature that the physical principles reveal, resides in the author's analyses of the way in which failure occurred, and how, in retrospect, failure made a unique contribution to eventual success.

How is this related to medical practice? Petroski's analytic style is similar to that used by expert physicians in reviewing cases that have had adverse or unintended outcomes, ie, failures. By meticulously reviewing hidden assumptions, false premises, unwarranted generalizations, and untested hypotheses, the crucial error and its ripple effect are exposed. The process of discovery has value for all who are involved in it; they now have an increment of practical insight they would not otherwise have had.

Major similarities between engineering and medical errors include: how a series of past successes can turn out to be failures with long latent periods; how misleading a purely mathematical analysis can be; the need for many different analyses to create the real world; and, most importantly, how the most successful practitioners are those who have made themselves the most knowledgeable about failures.

Pathologists learn early in their careers to make a friend of failure. Many clinicians traverse a similar learning curve, but others have a different view. "The operation was a success, but the patient died" is a common aphorism, which attempts to deny the existence of judgmental or technical error. The medical procedure that has the most in common with the analyses in Design Paradigms is the autopsy. While the autopsy is by no means the only effective form of medical case review, it is clearly in the front rank of such analytic methods. The autopsy is unique in its ability to reveal how far beyond our grasp perfection resides. The value added by the autopsy, as an informative medical procedure, has been the subject of extensive discussions and debate, but often these consist of theoretical and abstract arguments, which practice-oriented physicians find easy to ignore. That is one reason why this book, exceedingly concrete and definitely situated in the real world, is so important for physicians to read.

A seminal contribution by Dr Lucian Leape has initiated a radical change in the way that we view error in medicine. As a result, rational discussions of error are becoming acceptable in civilized medical discourse. In this new paradigm, errors are symptoms of flawed systems, not personal failures. Instead of ignoring errors, or pretending they don't exist, it should be recognized that errors are valuable, even essential, opportunities to create systems that function better in patient care. While no one would deny that there are some major differences between building bridges and managing sick patients, many important similarities underlie Petroski's failure analysis and Leape's error analysis. Physicians who read this book will deepen their understanding of the indispensable role error has in the world they inhabit, and they may discover a rationale for reevaluating the autopsy's contribution to contemporary medical practice.

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Tobacco

Smoke and Mirrors: The Canadian Tobacco War, by Rob Cunningham, 361 pp., with illus, paper, $25 CAN, Ottawa, Ontario, International Development Research Centre (order from Ronouf, 5369 Carleuk, Ottawa, Ontario, K1J 9L3), 1996.

Smoking is, as the old saying goes, a major cause of statistics. That is probably one reason Rob Cunningham begins his book on a more personal note, tracing the struggles of individual smokers: Julie Laperle, a 16-year-old Quebec girl who began smoking at the age of 12 and now smokes two to three packs a