

Practical Healthcare Epidemiology

Fourth Edition

Cambridge University Press

978-1-107-15316-5 — Practical Healthcare Epidemiology

Edited by Ebbing Lautenbach , Preeti N. Malani , Keith F. Woeltje , Jennifer H. Han , Emily K. Shuman , Jonas Marschall

Frontmatter

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Fourth Edition

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Preeti To my husband, Mark, and children, Nicholas and Sonya.

Keith For my infection prevention colleagues at Washington University School of Medicine and BJC HealthCare, who work tirelessly to improve the care of the patients we serve.

Ebbing To my wife, Gillian, and children, John, Kate, Thomas, and William.

Jonas To my wife, Maria, and children, Laila and David.

Jennifer For Maddy, Norah, and Vivian.

Emily To my husband, Andy, and my children, Jonah and Lily.

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Preface

An Introduction to Practical Hospital Epidemiology

Ebbing Lautenbach, Preeti N. Malani, Jennifer H. Han, Jonas Marschall,
Emily K. Shuman, and Keith Woeltje

It is with great pleasure that we introduce the fourth edition of *Practical Healthcare Epidemiology*. As noted by Dr. Loreen Herwaldt in the introduction to the first edition of this text, “Hospital epidemiology and infection control have become increasingly complex fields.”¹ While certainly true then, it is even more so now. The healthcare epidemiologist today faces an abundance of both challenges and opportunities. One need look no further than the recent emergence or reemergence of multidrug-resistant gram-negative bacteria, Middle East Respiratory Syndrome, and Ebola, to appreciate the dynamic nature of this field. Ongoing emphasis on such issues as pandemic preparedness, patient safety, and complex regulatory requirements related to infection prevention, highlights the need for the expertise of the healthcare epidemiologist in many arenas. The requirement for knowledgeable and well-trained healthcare epidemiologists has never been greater.

Healthcare-associated infections (HAIs) exact a tremendous toll in morbidity, mortality, and costs. A recent survey estimated that 4 percent of all patients admitted to US acute-care hospitals in 2011 developed HAIs, for a total of 721,800 such infections.² Among these patients, about 75,000 died during their hospitalizations. Total annual costs for the five major HAIs (surgical site infection, central line-associated bloodstream infection, catheter-associated urinary tract infection, *Clostridium difficile* infection, and ventilator-associated pneumonia) have recently been estimated at around \$9.8 billion.³

The primary focus of the healthcare epidemiologist remains the prevention of HAIs. In this regard, there has been substantial progress over the past several years, with significant reductions in the incidence of several HAIs, including central line-associated bloodstream infection, surgical site infection, and *C. difficile* infection.⁴ However, as indicated by the ongoing burden of HAIs noted above, there remains much work to be done. Indeed, the healthcare epidemiologist must deal with all aspects of the healthcare setting to prevent patients or staff from acquiring infection. These include outbreak investigation, surveillance, policy development, audits, teaching, advice, consultation, community links, and research. With the increasing acuity of the hospitalized patient

population and the growing utilization of other healthcare settings, (e.g., long-term acute care, outpatient, home care), the need for the healthcare epidemiologist will continue to increase dramatically in the coming years.

The knowledge and skills of the healthcare epidemiologist also lend themselves extremely well to addressing many other issues at the forefront of patient care today. Knowledge of healthcare epidemiology is useful for antimicrobial stewardship, quality improvement, technology assessment, product evaluation, and risk management. In particular, application of healthcare epidemiology-based practices has offered much to the patient safety movement. These include establishing clear definitions of adverse events, standardizing methods for detecting and reporting events, creating appropriate risk adjustments for case-mix differences, and instituting evidence-based intervention programs.^{5,6}

We recognize that several comprehensive textbooks of hospital epidemiology exist as excellent resources for infection control professionals.^{7–9} This book is not meant to replicate these textbooks but rather to complement them as a pragmatic, easy-to-use reference emphasizing the essentials of healthcare epidemiology. As a starting point, this overview of the important aspects of healthcare epidemiology should provide a good foundation for those entering the field of infection prevention. The practical nature of the book lends itself well to the very nature of healthcare epidemiology as a field that requires constant action (e.g., surveillance, interventions). While daily decisions must be based on a thorough evaluation of the data, they must also be practical in the context of the healthcare setting and surroundings of the practitioner.

This book is also distinguished by its focus on experience. While based solidly on the existing medical literature, this resource also offers real-world advice and suggestions from professionals who have grappled with many of the longstanding and newer issues in infection prevention. As with earlier editions of this book, we asked the authors to write their chapters as if they were speaking to an individual who would be running an infection prevention program and who was just starting in this field. The authors’ task was to prepare future

Preface

hospital epidemiologists for their new careers by summarizing basic data from the literature and by providing essential references and resources. In addition, we asked the authors to share their own experiences of what works and what does not work in particular situations.

We hope that this book will provide trainees and professionals in infection prevention, particularly the fledgling healthcare epidemiologist, the knowledge and tools to establish and maintain a successful and effective healthcare epidemiology program. Ours is a vibrant and exciting field that presents new challenges and opportunities daily. The prospects for the healthcare epidemiologist are virtually limitless, whether they are in infection prevention, antimicrobial stewardship, patient safety, or beyond. We hope that this textbook provides the foundation upon which many future years of further learning, innovation, and advancement are based.

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