Chapter 1: Overview

Preface

The field of healthcare epidemiology has expanded tremendously during the last few decades. What was once a specialty area, narrowly focused within hospital walls, has now grown to an extensive network of healthcare and public health professionals working collaboratively across a wide variety of healthcare settings, government agencies, and partner organizations to decrease healthcare-associated infections (HAIs) and antimicrobial resistance (AR).

One part of this partnership is rapid and efficient outbreak responses to prevent and halt the transmission of pathogens or spread of disease. The CORHA Principles and Practices for Healthcare Outbreak Response is intended as a comprehensive reference comprised of chapters and materials that cover key areas related to HAI/AR outbreak detection, reporting, investigation, and control. We hope that the CORHA Principles and Practices will serve as a useful resource for those trying to build, standardize, or improve upon their healthcare outbreak response capacities and practices.

Introduction

Throughout the CORHA Principles and Practices, we use the terms “HAI/AR outbreak” and “response.”

The term “HAI/AR outbreak” includes outbreaks involving infections that meet the definition of an HAI as well as infections or colonizations with organisms typically associated with the receipt of healthcare, including pathogens demonstrating resistance to antimicrobial treatment (AR pathogens). Public health agencies often respond to outbreaks that extend beyond traditional HAIs and AR pathogens, and beyond exposures found solely within healthcare settings. Therefore, the CORHA Principles and Practices includes content applicable to response activities involving noninfectious chemical and other toxic agents as well as outbreaks that include both healthcare-associated and community cases.

The term “outbreak response” (or simply “response”) refers to efforts made to assist with assessment and investigation of specific, acute HAI/AR risks. The types of hazards addressed by healthcare outbreak response include overt outbreaks, clusters of infections, sentinel cases (e.g., an uncommon HAI or emerging AR threat), or serious breaches in infection control practice. As this list suggests, response activities often extend to cover potential outbreaks: situations that portend danger and may require action to assess risk,
prevent exposure, or avoid harm. As used in the CORHA Principles and Practices, “healthcare outbreak response” is inclusive of this broader array of event types and activities.

The primary intended audience of the CORHA Principles and Practices consists of personnel at public health agencies at the federal, state, and local levels; however, the information presented here can also be useful to healthcare professionals, employees at healthcare facilities, and other partners involved in a healthcare outbreak response. It is important to acknowledge that the work involved in responding to and preventing HAI/AR outbreaks occurs across the healthcare–public health continuum. Healthcare institutions, public health and government agencies, and other partners working in this arena comprise a large community of professionals collaborating on the same goal: rapid detection of HAI/AR risks and intervention to stop outbreaks. Below we offer brief overviews of the chapters contained in this document as well as links to chapter sections and subsections.

Overview of Chapter 2: Fundamental Concepts

In the second chapter, the focus is on the background and basis for surveillance of healthcare-associated infections (HAIs) and antimicrobial-resistant (AR) pathogens as well as associated outbreak response activities. The chapter contains information on healthcare settings with which public health professionals may interact as part of an HAI/AR outbreak response; changes to healthcare delivery, regulations, funding, and public health capacity over time that have impacted HAI/AR surveillance practices and outbreak responses; and trends in surveillance, including descriptions of systems used to identify potential outbreaks as well as types of outbreaks and other events to which public health routinely responds.

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### Overview of Chapter 4: Outbreak Detection and Reporting
Chapter 4 examines the detection and reporting of potential outbreaks, including detection via reports and through use of surveillance data. Definitions of sentinel cases, clusters, and outbreaks are described. The section on direct reporting of outbreaks includes information on reporting within a healthcare facility and reporting to public health, entities that can report to public health, and types of events that may be reported. This is followed by an overview of the use of routine surveillance systems for cluster and outbreak detection. Strengths and limitations, key determinants of successful detection, and model practices are described for both types of detection methods.

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| Reporting Sentinel Cases, Clusters, and Outbreaks (4.2) | Purpose (4.2.1) | • Importance of reporting as a method to detect outbreaks |
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| Table 4.1 Potential Methods of Outbreak Detection by Healthcare Facilities and Public Health Agencies |
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### Overview of Chapter 5: Investigation and Control

The fifth chapter contains a review of the key elements and steps involved in the investigation and control of outbreaks involving HAIs and AR pathogens. The chapter is arranged to follow the steps typically followed in an outbreak investigation, recognizing that such steps may indeed not occur in linear order and will depend on the precise nature and needs of the response. The chapter also reviews the goals of a healthcare outbreak investigation and includes collections of resources to support and improve the HAI/AR outbreak response.

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| --- | --- | --- |
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  • Collaboration between public health and healthcare  
  • Importance of a systematic approach |
| Outbreak Investigation and Response Steps (5.1) | Perform an Initial Assessment (5.1.1) | • Initial information to be gathered when an outbreak is detected via reporting or use of surveillance data (5.1.1.1) |

- Tools that can be used for cluster detection using surveillance data (4.3.8.5) • Importance of tracking outbreaks (4.3.8.6) • Importance of complete reporting to identify multifacility and multijurisdictional outbreaks • Factors influencing multifacility and multijurisdictional cluster and outbreak detection • Table 4.1 Potential Methods of Outbreak Detection by Healthcare Facilities and Public Health Agencies • CORHA Keys to Success: Maximizing Outbreak Detection
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- Importance of the laboratory in diagnosis verification

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- Introduction to team roles
- Introduction of the concept of a coordinating agency
- Partners’ outbreak response teams, including healthcare facilities and regulatory partners (5.1.3.1)
- Escalation of response and partner roles (5.1.3.1)
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- Gathering of information on similar outbreaks, including information on the pathogen or type of infection
- Considerations for utility and burden of planned steps during preparations
- Considerations for on-site investigations
- Onsite preparation steps including gaining access to medical records, preparing for data collection (including tool development), and infection control preparation

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- Pseudo-outbreaks

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• Creation of a useful case definition  
• Stratified case definitions and classification criteria |
| Identify and Count Cases (5.1.7)                                       | • Retrospective and prospective case counting  
• Methods to retrospectively identify cases  
• Methods to prospectively identify cases  
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• Importance of systematic case counting and application of case definitions and classifications |
| Collect, Organize, and Analyze Data (5.1.8)                            | • Data sources for collection of data (5.1.8.1)  
• Importance and components of a standardized data collection tool (5.1.8.1)  
• Protecting information that could be used to identify a patient (5.1.8.1)  
• Organizing data into a line list (5.1.8.2)  
• Descriptive epidemiologic analysis (5.1.8.2)  
• Other data organization tools including maps, timelines, and epidemic curves (5.1.8.2)  
• Refining the hypothesis (5.1.8.3)  
• Considerations for use of analytic epidemiology (5.1.8.4)  
• How to conduct an analytic study (5.1.8.4 and Appendix A) |
| Perform an Infection Control Assessment (5.1.9)                        | • Considerations for performing on-site infection control assessments  
• Areas of focus during infection control assessments  
• Considerations for staff interviews |
| Consider an Environmental Assessment (5.1.10)                          | • Determining possible environmental factors that may have contributed to an outbreak  
• Environmental assessment as part of the infection control assessment  
• Determining when environmental sampling is appropriate  
• Laboratory considerations for environmental testing |
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• Providing written recommendations  
• Importance of follow-up after recommendations  
• What to do when there is imminent potential harm to patients |
| Interpret Results (5.1.12) | • Considerations for interpretation of results following investigation |
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• Distribution of the final report (5.1.14.2)  
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• Box 5.2 Goals of an Outbreak Investigation  
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Appendices

- Appendix A: Cohort and Case-Control Studies

1st Edition – October 2022

URLs in this document are valid as of August 1, 2022.

At the time of publication of this first edition of the CORHA Principles and Practices for Healthcare Outbreak Response, additional chapters and supplements are under development. These will be included in subsequent editions and the tables above will be updated to reflect their contents.

Disclaimers: The findings and conclusions in this document are those of the authors and do not necessarily represent the official views of CDC nor those of other CORHA member organizations.

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