Learning Objectives

After studying this chapter, you should be able to:

• Define the concept of public health informatics and explain the aspects that it has in common with medical informatics.
• List and briefly explain the four principles that define, guide, and provide the context for the types of activities and challenges that comprise public health informatics and differentiate it from medical informatics.
• List and briefly discuss three major developments that have increased the importance and immediate relevance of informatics to public health.

Overview

The technology necessary for effective, innovative application of information technology to public health practice is available today at very reasonable costs. The barrier to the widespread application of such technology is that few public health professionals have received any formal training in informatics, and most lack even a basic understanding of the nature and purpose of informatics as a discipline. Although the discipline of public health informatics has much in common with other informatics specialty areas, it differs from them in several ways. These include (1) a focus on applications of information science and technology that promote the health of populations, rather than of individuals; (2) a focus on disease prevention, rather than treatment; (3) a focus on preventive intervention at all vulnerable points in the causal chains leading to disease,

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injury, or disability; and (4) operation within a governmental, rather than a private, context. Drivers of change forcing public health professionals to be conversant with the development, use, and strategic importance of computerized health information systems include public health reform, the growth in managed care, and the information technology revolution.

Introduction

It is 8:30 AM, a few years from now. As the director of a local health department, you are looking forward to a relatively quiet morning working on an initiative to promote the use of bicycle helmets in your community. When you start your computer, the screen directs you to place your thumb on the small scanner attached to the monitor. After you have been recognized and logged in, the computer says, “Good morning,” launches your calendar, and automatically opens the working draft of the initiative.

As you prepare to begin dictating, an alert pops up on your screen to the sound of a barking dog: “Rover has detected an unusual incidence of *Escherichia coli* *O157:H7,*” the alert says. You are presented with several options: SURVEILLANCE DATA, LEARNING RESOURCES, and COMMUNICATIONS. You select SURVEILLANCE DATA and are presented with a table and a chart of recent cases of *E. coli*—both suspected and laboratory-confirmed—in your community. From there, you click on the MAP THIS button, and a “pin map” of the cases in your county is displayed. You click the ZOOM OUT button, and the pin map expands to show your county and adjacent counties—one of which is in the adjacent state. You click on the TIME SERIES button and are shown a classic epi-chart, with associated statistics at the bottom. It surely has the look of an outbreak.

In the next few minutes, without ever leaving your chair, you send an alert about the cluster of cases to the primary care clinicians and hospital infectious disease control staff in your community, as well as to your own epidemiology staff. You send an electronic food-borne illness questionnaire to your local “sentinel event” network of care providers (attaching a predefined case definition and other instructions), as well as to a standing community-based control group. You instruct your computer to schedule a priority videoconference with your fellow health officers and the state infectious disease epidemiologist; and you locate and download various prevention guideline documents from the Centers for Disease Control and Prevention (CDC). Finally, you turn to a list of on-line learning resources, noting the availability of several interactive, full-motion video courses, to brush up on the diagnosis, clinical presentation, epidemiology, and control of *E. coli O157:H7.*

To many in public health today, this scenario seems rather futuristic. After all, consider some of the elements that would have to be in place for this scenario to occur: biometric authentication of the user (via the thumb scan); software “agents” automatically searching distributed clinical and laboratory databases for apparent outbreaks of disease; software for epidemiologic