CHAPTER 1

The Health Research Process

Health research is the process of systematically investigating a single, well-defined aspect of physical, mental, or social well-being.

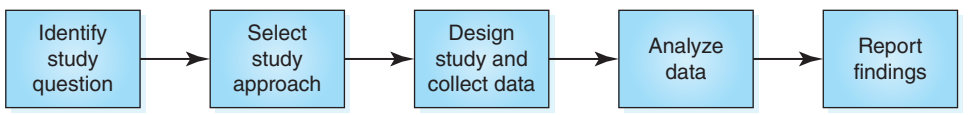
1.1 The Research Process

Research is the process of systematically and carefully investigating a subject in order to discover new insights about the world. No matter what the goals of a research project are or what methods are used to achieve those goals, the five steps of the research process are the same (**Figure 1-1**). The first two steps are to identify a study question and to select a general study approach. These two steps are often completed concurrently, because the approach selected may require the refinement of the study question. Once the objectives and the approach are set, the last three steps are to design the study and collect data, to analyze the data, and to write and share a report about the findings. These steps apply to nearly every research project. A research project is not finished until all five steps have been completed.

1.2 Health Research

Health research examines a broad spectrum of biological, socioeconomic, environmental, and other factors that contribute to the presence or absence of physical, mental, and social health and well-being. **Population health research**

FIGURE 1-1 The Research Process



involves humans as the unit of investigation, rather than focusing on molecules, genes, cells, or other smaller biological components. Population health research ranges from clinical case studies with just a few individuals to global public health studies that may include many thousands of participants. Health research studies apply the tools from a diversity of fields. Some draw on the tools of the laboratory sciences, such as molecular biology, microbiology, immunology, nutrition, and genetics. Many use the tools of **demography** (the study of populations and population dynamics, such as birth and death rates), epidemiology, and various social sciences, including psychology, sociology, anthropology, and economics.

A distinction is made between routine practice activities and health research. It is not research when an epidemiologist working for a health department tracks down the source of an outbreak of gastroenteritis. However, that investigation may become a research project when the outbreak investigation team identifies an unusual food item as the cause of the outbreak, does additional survey and laboratory work to confirm their hypothesis, and then shares that discovery by writing a formal report describing their methods and results. It is not research when a clinician reads several articles about an unusual disease or completes other continuing education activities. It is research when a clinician conducts a systematic search of the literature, completes a novel synthesis of the compiled articles, and then writes and disseminates that summary. It is not research when an organization asks its clients to complete a customer satisfaction survey so that opportunities for quality improvement can be identified. However, it is research when a client survey uses a validated questionnaire and sampling methods, is approved by an ethics committee, answers a question that builds on the evidence base provided by previously published articles, and has its results shared through presentation or publication.

Some studies that are very specific to one population at one place and in one point in time are not particularly helpful for identifying broader patterns. However, most health researchers hope that their findings will reveal trends, relationships, and theories that are generalizable to other populations, places, and times. When these researchers complete the health research process by sharing their findings with others, they are contributing to the evidence base used for health policy and practice.

1.3 Health Research Purposes

Research in the population health sciences often seeks to answer questions about community health profiles, risk factors for disease, clinical effectiveness, and the impact of interventions. Some of the common reasons for initiating a health research study include:

- Needs assessment: What is the health status of this population? What are the major health concerns of members of this population? What health-related needs in this population are not being addressed? A population can be defined as any well-defined group of individuals, such as the patients of a particular hos pital, the clients of a particular organization, the residents living in a particular town, the students attending a particular school, or some other set of people.

- Risk assessment: What are the threats to health in this population? What are the risk factors for **morbidity** (illness), **mortality** (death), disability, and other health issues?
- Applied practice: How well are we preventing, diagnosing, and treating health concerns in the populations we serve? Similar questions can be asked by health professionals in a diversity of fields, including medicine, nursing, public health, physical therapy, occupational therapy, pharmacy, dentistry, optometry, clinical psychology, kinesiology, health policy, health administration and management, and others.
- Outcomes evaluation: Was this intervention successful at improving health status in this population? Alternative versions of this question might ask about the effectiveness of a procedure, process, project, program, policy, or other activity.

The goal of any single health research project is usually modest: to answer one well-defined question. When many researchers add their findings to the scientific literature, the cumulative information provides an evidentiary foundation for improving the health of individuals and communities.

1.4 Book Overview

Anyone who is committed to seeing a new and valid project through to completion can contribute to advancing health science. Health research does not require a license. It does not require a doctorate or a master's degree. It does not even require coursework in research methods, although that is certainly helpful. What research demands is perseverance and patience, honesty and integrity, carefulness and attention to detail, the willingness to learn new knowledge and develop new skills, openness to expert advice and feedback, and the ability to criticize and revise one's own work and writing. These are personal character traits that everyone can cultivate and develop.

This book is intended to serve as a handbook for population health researchers. The chapters are organized according to the five steps of the research process. The first section provides suggestions for selecting an appropriately focused research question and establishing good relationships with collaborators and mentors early in a project. The second section opens with a chapter that summarizes the various approaches to gathering data and then presents an overview of each of the main study designs used in the population health sciences. The third section describes the data collection process, and it emphasizes research ethics along with the methods for collecting new data. The fourth section summarizes common strategies for data analysis. The fifth section presents tips for writing success and a step-by-step guide for preparing a manuscript for review and publication. If the goal is to publish the findings of a study, it may be helpful to write throughout the research process. Thus, some readers may find it helpful to read some of the chapters from the fifth section of the book prior to finalizing their research plans.

This guidebook is not meant to be a compendium of everything that health researchers know about study design, data collection, and statistical analysis. Instead, it provides a comprehensive overview of the entire process. The best way to learn about health research is to do actual research and to learn firsthand how the research process works. As a research project unfolds, most researchers will benefit from consulting specialized references. Many excellent books, journal articles, technical reports, and other online and library resources contain the advanced information required for complex study designs and analytic techniques. It is also essential for the consulted resources to include human experts—professors, supervisors, colleagues, coauthors, librarians, statistical consultants, and others—who can provide insights gained from personal research experience and can direct new investigators to the background readings and other information that will be most helpful as they explore their selected research questions.