Why Statistics for Public Managers and Analysts?

CHAPTER OBJECTIVES

After reading this chapter, you should be able to

- Appreciate the importance of using data in public management and analysis
- Identify levels of competency and proficiency in data analysis
- Describe strategies for increasing proficiency in data analysis
- Understand the importance of ethical principles in data analysis

ROLE OF DATA IN PUBLIC MANAGEMENT

Why research? Why statistics? The ethos of public management is to "go out and make a difference," not to sit behind a desk and crunch numbers. Public managers often join agencies because they seek to serve and help their communities and country. Not surprisingly, some managers are puzzled by the suggestion of engaging in research and statistics: research appears boring in comparison with developing and implementing new programs, and statistics seems, well, impossibly challenging with little payoff in sight.

In fact, analytical techniques involving research and statistics are increasingly in demand. Many decisions that public and nonprofit managers make involve data and analysis, one way or another. Consider the following common *uses of analysis and data*:

First, data and objective analysis often are used to *describe and analyze problems*, such as the magnitude of environmental disasters (for example, oil spills), the extent of social and public health problems (such as homelessness or the AIDS epidemic), the extent of lawlessness, the level of economic prosperity or stagnation, or the impact of weather-related problems such as brought on by hurricanes and snow storms. For example, it matters whether the illiteracy rate among 12 year olds is 3 percent or 30 percent, or somewhere in between. By describing the extent of these problems and their underlying causes accurately, managers are able to better formulate effective strategies for dealing with them. Policy analysis often begins by describing the extent and characteristics of problems and the factors associated with them.

Second, data are used to *describe policies and programs*. What are programs and policies expected to achieve? How many services are programs expected to provide? What are some milestones of achievement? How much will a program cost? These questions involve quantifiable answers, such as the number of national guardsmen that are brought in to assist with search and rescue efforts after a major hurricane, or the number of evacuees for whom officials expect to provide refuge. Policies and programs can be described in quite detailed ways, involving distinct program activities, the duration and geographic scope of activities, and staffing levels and area program budget data.

Third, programs produce much routine, administrative data that are used to *monitor progress and prevent fraud*. For example, hospitals produce a large amount of data about patient visits, who attended them, their diagnosis, billing codes, and so on. Schools produce vast amounts of data about student achievement, student conduct, extracurricular activities, support and administrative services, and so on. Regulatory programs produce data about inspections and compliance. In many states, gaming devices (such as slot machines) are monitored electronically to ensure that taxes are collected and that they are not tampered with. Administrative data assist in monitoring programs, and managers are expected to be familiar with these data.

Fourth, analysis is used to guide and *improve program operations*. Data can be brought to bear on problems that help managers chose among competing strategies. For example, what-if analysis might be used to determine the cost-effectiveness of alternative courses of action. Such analysis often is tailored to unique situations and problems. In addition, client and citizen surveys might be used to inform program priorities by assessing population needs and service satisfaction. Systematic surveys provide valid and objective assessments of citizen and client needs, priorities, and perceptions of

programs and services. Systematic surveys of citizens and clients are used increasingly and are considered a valuable tool of modern management.

Fifth, data are used to *evaluate outcomes*. Legislatures and citizens want to know what return they are getting from their tax dollars. Did programs and policies achieve their aims? Did they produce any unexpected results? Most grant applications require public managers to be accountable for program outcomes. Public managers must demonstrate that their programs are producing effective outcomes and that they are doing so in cost-effective ways. This demand for outcome evaluation and monitoring far exceeds any requirement of proper funds management. Analysis can also be used to determine the impact of different conditions on program effectiveness, leading to suggestions for improving programs.

Data and analysis are omnipresent in programs and policies. They are there at every stage, from the inception of programs and policies, to their very end. Of course, decisions are also based on personal observation, political consensus, anecdotal and impressionistic descriptions, and the ideologies of leaders. Yet data and analysis often are present, too, one way or another.

This is because analysis is useful. Specifically, quantitative analysis aids in providing an objective, factual underpinning of situations and responses. Analysis, along with data, helps quantify the extent of problems and solutions in ways that other information seldom can. Analysis can help quantify the actual or likely impact of proposed strategies, for example, helping to determine their adequacy. At the very least, a focus on facts and objective analysis might reduce judgment errors stemming from overly impressionistic or subjective perceptions that are factually incorrect. So managers are expected to bring data and analysis to the decision-making table.

COMPETENCY AND PROFICIENCY

Analysis requires competency and proficiency. The standards of accredited graduate programs in public administration and affairs recognize the importance of quantitative analysis. The accrediting organization for these programs, the *National Association of Schools of Public Affairs and Administration (NASPAA)*, requires that the "common curriculum components shall enhance the student's values, knowledge, and skills to act ethically and effectively in the application of quantitative and qualitative techniques of analysis." NASPAA further stipulates that such skills should be applied to policy and program formulation, implementation, and evaluation, as well as to other decision-making and problem-solving activities.

These uses of data and analysis imply the need for six *competencies for analysis*, which can be addressed through this course. First, managers and analysts will have to be *familiar with data sources* in their lines of business. They will need to know what data are available and to what uses they are commonly put. For example, are they used for monitoring? For estimating service needs? For determining program efficiency? For describing community conditions? Beyond this, managers will also need to be able to determine the validity of these data and understand their limits. They will need to know whether data have been collected in ways that do not induce additional bias. Finally, managers will need to be able to develop new uses of data, for dealing with situations and problems as they arise.

Second, managers and analysts need competencies to *gather their own data*. Simply, existing data do not always address important issues at hand. For example, they may not be adequate to determine client needs or evaluate programs. The ability to collect new data implies familiarity with and competencies in conducting different types of research, such as archival research, or in conducting scientific population or program client surveys. Many managers value the ability of their staff to conduct these types of research. Client and citizen surveys are increasingly a staple of public management.

Third, public managers and analysts need to be able to *analyze the data*. Without analysis, it is not possible to generate meaningful information about program efficiency and effectiveness, for assessing whether a program is on track and for determining and identifying new client needs. Analysis requires competency in statistics. Analysis must be done in ways that shine light on important problems. It must also be done in ways that are sound, defensible, objective, and consistent with current practice.

Fourth, public managers and analysts need to be able to *communicate* their results. Communication requires the ability to explain complex or abstract concepts in ways that are accessible to different audiences. Results should be explained in simple ways without oversimplifying. Communication also involves effective writing and presentation skills. Communication is often used to meet additional objectives of accountability and transparency, and thus also to seek out and engage different publics and stakeholders in order to enhance trust in public and nonprofit organizations and their programs and policies.

Fifth, analysts must be able to bring to their analysis *the theory and practice of management and policy analysis*. Understanding the specific and unique problems of public and nonprofit programs and their context informs analytical tasks to be carried out. The needs of homeless people in New York City are different from those in Louisiana, as are the priorities of

stakeholders and affected publics. Analytical tasks must be infused, from the start, with a clear sense of the specific program and contextual issues; without context or purpose, analysis is a blind exercise in technique only, not connected to purpose.

Sixth, analysts must have a sound and strong sense of *ethics*. Technical skills alone are not enough to ensure soundness of analytical purpose and practice; analysis also requires a commitment to being truthful, complete, mindful and useful. Ethics affects how analysts and managers approach matters of analysis and communication and how they view the role of research and analysis in their field. Ethics affects which questions analysts and managers ask, and how they deal with them. Ethics is a hallmark of modern professionalism, and a key to public service; it is discussed in greater detail in the next section.

These six competencies are to varying degrees grounded in the canons of scientific research and statistics. *Scientific research* is the careful, systematic process of inquiry that leads to the discovery or interpretation of facts, behaviors, and theories. The methods used for scientific research include standards and procedures for gathering, analyzing, and reporting data such as through surveys, focus groups, or archival research, for example. Scientific research is distinguished from personal and other forms of research or inquiry by rather strict standards for accepting new facts and theories as knowledge, and by a process that includes other scientists in making such determinations. Science sets a high standard for what is considered to be valid knowledge. As a branch of science, *statistics* is the body of systematic knowledge and practice that provides standards and procedures for correctly analyzing one's data, which often are collected in the process of scientific research.

Research and statistics provide essential frameworks and language that inform the six competencies described here. Research and statistics provide guidelines for determining what to measure, how to collect data, and how to draw conclusions from data. These guidelines help managers, for example, to evaluate the scientific validity of data, whether they use existing data or gather their own. Indeed, public management data often are incomplete, biased, or inaccurate in some way, and managers need to know how to address these matters. Some problems are correctable, whereas others warrant caveats. Knowledge of these standards can also help managers and analysts avoid problems, such as when they plan to collect their own data. This is not to say that all knowledge or information used by managers meets or should meet scientific standards, but the above competencies, as well as previously mentioned uses of data and analysis, do require careful attention to these matters. Knowledge of scientific standards and research processes, discussed in this book, cannot be ignored without sacrificing credibility.

Students and managers seeking to improve these competencies often experience different *stages of proficiency*. Respectively, these stages might be called the "know nothing," journeyman, technocrat, and sophisticated expert stages. Understanding these stages can help guide one's progress and development activity.

Know Nothing. Many people who are new to public and nonprofit management do not bring with them much background about data in their lines of business, or ways in which data might be used for improving program efficiency. This is not a problem but a fact. A good share of these students are reserved, skeptical, fearful, or even hostile about the uses of data and statistics. Then, they will need to acknowledge these feelings and work to become aware of ways in which data are usefully and correctly applied in management and policy analysis. To get beyond this stage, they will need to obtain a good foundation in research and statistics, and succeed in finding useful examples in each of the five areas of use described earlier.
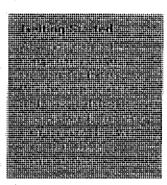
Journeyman. People in this stage have worked for a few years in their lines of business. As such, they have usually seen some applications and are clear about the utility of data and analysis. They sometimes use data for monitoring program progress. However, lacking research and statistics skills, they often do not see themselves as being qualified to develop broader applications or even to analyze data in relatively simple ways. The purpose of this course is to provide readers with the necessary foundations and skills and to encourage the development of new uses of data and analysis in their lines of business. People at this level are often concerned about communicating their results and methods correctly, and this skill should also be focused on at this stage.

Technocrat. People in this stage have acquired varying levels of technical mastery of research and statistics. Some technocrats are highly skilled, whereas others have only a modest level of ability. A common problem is that technocrats are unable to integrate and guide their analysis with the substantive concerns of program and policies in their lines of business. They might even view themselves as statistics resource persons, rather than as managers and employees tied to specific programs and policies—the fifth competency (relating research and statistics to the theory and practice of management and policy analysis) is missing. The main challenge for technocrats is to learn how to put research and statistics in service of programs and policies. They need to put these substantive concerns on par with the technical analysis.

Sophisticated Expert. People at this stage have found the right balance between the development of policies and programs and the use of objective data and analysis to further decision making. They understand both.

Because they have spent several years in their lines of business, they are familiar with the relevant existing data, they know the strengths and weaknesses of these data, they are familiar with a range of applications, and they are able to develop new applications and collect original data. They are well-rounded in the use of data. Sophisticated experts often have a positive orientation toward continuing, professional education. They may challenge themselves by writing articles for scholarly journals and making presentations at conferences.

At whatever stage of proficiency you are at, think of how you can benefit from increased use of data and analysis. Data and analysis are increasingly used skills in public and nonprofit organizations. Whether positions are analytical, such as policy analysis, budgeting, or information technology, or people oriented, such as counseling, human resources, or social services, analytical skills are in demand for analyzing data, conducting surveys, and communicating quantitative findings to a broader audience. Program managers, city managers, and elected officials, too, require a solid grasp of analytical skills, for monitoring performance, detecting fraud, and improving productivity. Almost every department needs people with analytical skills, and jobs associated with analytical skills often command a salary premium.[1]

ETHICS IN DATA ANALYSIS AND RESEARCH

The effectiveness of data and analysis in decision making depends on more than just technical competency; it also depends on the ethical integrity with which analysis is performed and presented. When questions surface about the ethics of an analysis, its credibility suffers, and people may be unwilling to give it much, if any, consideration. Specifically, there are three *areas of ethical concern*: (1) the integrity of purpose, (2) the integrity of the process of analysis and communication, and (3) the integrity of dealing with human subjects. When research and analysis are clear about these matters, and technically proficient, too, then the role of analysis in decision making and policy can be enhanced.

First, managers need to be clear about the purpose of their analysis. Analysis often has *dual purposes*: (1) to further programs and policies, such as by making them more efficient or effective, and (2) to establish factual, objective truths that meet standards of scientific evidence and that hold up under scrutiny. The first purpose causes analysis to focus on matters that are relevant to the agency and its mission; analysts need to be forthright in

disclosing what questions they considered, and that which they did not—no analysis can cover everything. The second purpose implies that analysts should be open to all facts, whatever they are, and ensure that all facts comply fully with standards of scientific evidence. Analysts must disclose and issue caveats for instances in which this is not the case. Ethics in analysis requires full disclosure of the purpose of the analysis, and all the biases, trade-offs, and shortfalls encountered along the way.

These dual purposes can come into conflict, forcing ethical choices and decisions. For example, what is a manager to do when careful analysis shows his or her programs to be less effective than hoped for? Should pursuit of mission cause a blind eye to facts that are contrary? Such results may indicate the need for further research or to consider future program changes. Consider another example: Should the agency intentionally ignore questions or analysis that could strengthen the arguments of those who advocate against the program or agency? Agencies cannot totally ignore their fiduciary responsibilities to society at large and thus their broader impacts. Such counterarguments should be taken into consideration in some way. These tensions are quite common in practice, and they cannot be ignored or swept under the rug.

Second, managers need to consider the integrity of the analysis and communication process. Many of these considerations are based on the *guiding principles of scientific research*—to be honest, objective, accurate, and complete. Analysts should not hide facts, change data, falsify results, or consider only data that support a favored conclusion. For example, data may be sketchy and incomplete, and management judgment is that such information is better used than ignored. Then the poor quality of the information needs to be clearly stated and a caveat given. Analysts should also fully report the sources of their data, data collection methodologies, any possible gaps and shortfalls, and they should assess the impact of such shortcomings on their findings.

It is obvious that facts and findings should not be altered or manufactured in any way. That is outright lying, and people will be justly outraged to know that they have been deceived. Regrettably, each year cases of scientific misconduct and fraud make headlines. However, it is equally important that analysis be as meticulous and objective as possible in testing its own findings. Findings should be checked for errors and inaccuracy. Conclusions should be examined for the possibility of alternative or rival explanations. The impact of assumptions, gaps, and bias should be examined. Doing so is not only proper, but it also strengthens study findings by providing detailed knowledge about their validity and robustness. The more that is known about the data and results, the more confidence that others may have in them.

Communication in research matters, and results should be presented in straightforward and nonmisleading ways. For example, analysis should not

adjust scales to give the appearance of a significant increase when the increase is in fact minor and insignificant. Such misrepresentations are considered the same as lying with statistics. Findings should be communicated in ways that are straightforward and easy to understand, for both experts and nonexperts, without oversimplification or deception. These ethical norms are not merely standards for evaluating analysis that has already been undertaken and presented; rather, these norms provide essential guidance to analysts throughout the entire analytical process, as they decide what to analyze, how to write up their findings, and how to present them.

Third, in recent years considerable attention has been given to the impact of research on the *well-being of human subjects* in research. Some key ethical principles in research involving people are that their participation should be voluntary and based on informed consent (that is, they should know what they are getting involved in), that information about them should be held confidentially, and that risks of harm to subjects should be minimized and reasonable in relationship to anticipated benefits. Concerns about the well-being of human subjects arose from various medical research experiments that intentionally misled patients and exposed them to great harm.

Some landmark examples of *scientific misconduct* in medicine include the Nazi war crimes during World War II, in which concentration camp prisoners were subjected to torture and poisonous injections to see how they would be affected. In the United States, the Tuskegee syphilis study (1930–1972) used as its subjects several hundred black males with untreated syphilis, without informed consent. Even after penicillin was found to be an effective antibiotic treatment in the 1940s, these black males were neither informed about nor offered treatment choices. In the Willowbrook study, 1963–1966, newly admitted children with mental handicaps were injected with hepatitis in order to track the natural history of the disease. Parents had to approve of the treatment, but approval was also necessary as a condition for admission into this overcrowded facility.

Regrettably, these cases do not stand alone. Instances of deceit and coercion, whether subtle or blatant, led to the development of the ethical principles mentioned earlier. There are many other examples of research misconduct, too. For example, in one case, public health workers lost a confidential file of known AIDS patients that was later sold in a local nightclub. Most human subject research is now overseen by institutional review boards (IRBs) to ensure that risks to subjects are reasonable, and that possible harm is identified and minimized. These boards are committees at universities and other research institutions composed of scientists who evaluate the protocols of proposed research. The point is that we confront ethical issues in research pretty much every time we do research, and we need to learn from past errors. For example, what ethical issues are involved in the push to have the

Table 1.1 ——————⌁⌁— Ethics of Research and Analysis

Be honest:
1. Do not hide facts, change data, falsify results, or use only data that support your conclusion.
2. Present results in straightforward and nonmisleading ways. For example, do not adjust scales to give the appearance of a significant increase when the increase is minor or insignificant. Also, do not suggest a level of precision that is not present.

Be complete:
3. Report all data and results that relate to a conclusion, not just those that support it.
4. Identify caveats and alternative explanations that may qualify your findings, even if no data exist to evaluate these caveats or alternative explanations.
5. Report the sources of your data, data collection methodologies, possible gaps and shortfalls, and impact on findings.
6. Be thorough, meticulous, and objective in your analysis, conclusions, and communications.

Be useful:
7. Try to produce information that can help your employer, other stakeholders, and the public interest.
8. Communicate information and results in ways that nonexperts can readily understand.

Be mindful:
9. Information is power; be aware of possible negative consequences. Address possible negative consequences of your analysis by considering further analysis, by considering the interests of affected parties, and by identifying relevant caveats in findings.
10. Respect the interests of human subjects whose data are being analyzed. They may have rights to privacy and "hold harmless" clauses. Obey research protocols.

Food and Drug Administration approve some drugs early, before they have been fully tested? The notions of research not causing unnecessary harm and being upfront with participants are now fully established ethical principles. If analysis involves access to confidential data, then steps must be taken to ensure that these data are protected. The impact of research on human subjects must be considered, and steps undertaken to minimize and address harmful impacts. Managers also need to be mindful of the negative impacts that their analysis can have. The interest of affected parties should be considered, for example, by ensuring that conclusions are accurate and fair. Table 1.1 provides an overview of important ethical principles.[2]

SUMMARY

Analysis and data are commonly used by public and nonprofit managers to support decisions. Analysis is useful because it helps provide an objective, factual underpinning to situations and programs and helps quantify the extent of problems and solutions. At the very least, a focus on facts and objective analysis can help reduce judgment errors that stem from impressionistic or subjective perceptions. Analysis and data often are used to describe problems, programs, and policies; to assist in monitoring programs and in making decisions that might make them more effective or efficient; and to evaluate outcomes.

The effective use of analysis and data requires competency in the following areas: knowing existing data sources, their applications, and their limitations; having an ability to gather one's own data; having an ability to analyze data; being able to communicate findings; being able to guide analysis by the specific, substantive program and policy interests; and being aware of ethics practices. Managers who seek to increase their competency often experience different stages of proficiency: "know nothing," journeyman, technocrat, and the sophisticated expert.

The effectiveness of data and analysis in decision making depends on more than just technical competency; however, it also depends on the ethical integrity with which research is performed. Areas of ethical concern involve the integrity of the research purpose, the integrity of its analysis and communication, and the integrity of dealing with human subjects. Analysis in public and nonprofit organizations often serves dual purposes, namely, to promote programs and policies and to establish factual, objective truths that meet standards of scientific evidence. Analysis should be forthcoming about the purposes that it serves and about the ways in which these purposes have affected it.

KEY TERMS

Areas of ethical concern (p. 10)
Competencies for analysis (p. 7)
Dual purposes (of analysis) (p. 10)
Guiding principles of scientific research (p. 11)
NASPAA (p. 6)

Scientific misconduct (p. 12)
Scientific research (p. 8)
Stages of proficiency (p. 9)
Statistics (p. 8)
Uses of analysis and data (p. 5)
Well-being of human subjects (p. 12)

Notes

1. To learn more about salaries in public and nonprofit administration, take a thorough look at salaries at www.bls.gov/oes/current/oessrci.htm

(for government, scroll down and select sector 92; for nonprofits, select NAICS 712100, museums, or NAICS 813300 and then the subgroup "community and social services." For an interesting look at careers, visit www.naspaa.org/students/careers/careers.asp. This site also offers salary information.

2. Table 1.1 deals with ethics in research and data analysis, but it is also useful to consider codes of professional conduct generally. Most professional organizations have such codes, such as the American Society for Public Administration (www.aspanet.org) and the International City/County Management Association (www.icma.org).

Research Methods

This section examines research methods and their application to public and nonprofit management as well as to policy analysis. *Research methodology* is the science of methods for investigating phenomena. Research methods are used in almost every social science discipline. The chapters in this section provide an in-depth examination of the research methods that managers and analysts need to be familiar with, so that they can gain the competencies described in Chapter 1, such as to gather, analyze, and communicate facts and findings in their lines of work.

In this brief introduction, we offer a few distinctions that shape a useful perspective about research methods. First, research methods can be applied to problems found in many different fields, including the sciences and public and nonprofit management and analysis. Here, we examine research methods used to bring understanding to three important problems that public and nonprofit managers and analysts commonly face: (1) evaluating the past performance of programs and policies, (2) monitoring the present performance of programs and policies, and (3) forecasting the future of programs, policies, and community conditions. Each of these areas involves questions about facts, relationships, understanding, and more. These problems span questions about the past, present, and future and are relevant to many areas of public and nonprofit management.

Second, we can distinguish between two research purposes. Generally the purpose of *basic research* is to develop new knowledge about phenomena such as problems, events, programs, or policies, and their relationships. Here are some basic research questions in public and nonprofit management: What is the nature of citizen apathy? What is the nature of citizen voluntarism? Which factors affect voluntarism? What consequences does voluntarism have? Or, what are the activities and outcomes of programs or policies? And, why do some people have an aversion to statistics? These questions clarify the nature and relationships among phenomena by asking, generally, "What is this, and what consequences does it have?" This question can be asked with regard to events in the past, present, or future.

But research and analysis in public and nonprofit management also serve applied and highly practical purposes. *Applied research* is used to solve practical problems. Examples of applied research questions include the following: What can governments do to reduce citizen apathy? How can governments increase the use of certain programs? What can be done to minimize the impact of turnover among political appointees on program quality? What can be done to increase students' interest in statistics? These questions clearly have practical matters in mind. They often ask, "How can this be done or improved?"

Research begins by asking questions, and managers and analysts will encounter both basic and applied questions in their work. For example, program evaluation might involve basic research questions such as, "What is the program achieving?" Or it might involve applied research questions such as, "How can the program be made more effective?" Both kinds of questions are important, and research methods help managers and analysts formulate and address them. Indeed, questions about improving programs presume knowledge of what these programs do and what they have achieved.

Third, after raising questions, managers and analysts must choose among a broad range of research methods to answer their questions. Research methods often are classified as quantitative or qualitative in nature. *Quantitative research methods* involve the collection of data that can be analyzed using statistical methods. Such data typically are collected through surveys or compilations of administrative records, and they produce numbers used to describe (that is, to measure) the extent of societal problems (such as teenage violence or homelessness, for example), to monitor program operations, to determine program efficiency and effectiveness and to analyze by how much they can be improved, and to evaluate the impact of programs.

Qualitative research methods refer to the collection and analysis of words, symbols, or artifacts that are largely nonstatistical in nature. Such data often are collected through interviews, focus groups, and direct observation. Typically the purpose of qualitative research is to identify and

describe new phenomena. Qualitative research provides a detailed, rich understanding of what is going on and why it matters to stakeholders, in their own words. Qualitative research is used to identify problems and the factors associated with these problems. It is also used to describe programs and policies, such as their priorities and methods of operation, as well as processes through which programs and policies affect outcomes. Qualitative research can also suggest ways in which programs might be improved.

Both quantitative and qualitative methods are indispensable in addressing questions of basic and applied research. Quantitative research requires solid knowledge of existing phenomena and how they are related to each other. Simply, before we measure something, we need to be certain that we know what we are measuring and that we are measuring the right thing. However, qualitative research does not provide much specific information about the magnitude of problems and phenomena, nor can it offer conclusive, statistical proof about the impacts of programs and policies. Hence, research in public management and analysis typically uses both quantitative and qualitative research methods.

Managers and analysts need a working familiarity with a range of basic and applied, quantitative and qualitative research methods. The chapters in this section reflect a diversity of purposes and methods, providing many examples of the distinctions described here. Chapter 2 introduces basic concepts of research and applies these concepts to program evaluation. Managers and analysts are often called upon to demonstrate the outcomes of public and nonprofit programs and policies. Program evaluation is an important method for holding people accountable, focusing on questions about how programs and policies performed in the past. The chapter explores experimental and quasi-experimental designs for evaluating programs and gives examples. Program evaluation demonstrates the use of both basic and applied research, and the need for both qualitative and quantitative research methods.

Chapter 3 addresses the problems of conceptualization and measurement that affect program evaluation and other research approaches in public management and policy analysis. For example, how are abstract concepts like democracy, apathy, safety, self-sufficiency, or congestion to be measured? The chapter discusses the problem of conceptualization, measurement validity, and the importance of measurement scales and levels.

Chapter 4 describes additional research methods for public managers and analysts. It deals with research on problems that involve the present (monitoring) and the future (forecasting). Specifically, it discusses performance measurement, which is increasingly used for program monitoring and to provide accountability. The chapter also applies criteria of validity, developed in Chapter 3, to the measures of performance measurement.

Chapter 4 also examines common research methods for forecasting. The discussion of these methods is concise but encompassing and includes examples.

Chapter 5 looks at data collection methods. An important competency for analysts and managers is familiarity with the data sources in their lines of work. This chapter discusses uses and challenges of secondary data, administrative and archival data, and survey data. It provides guidelines for conducting surveys, including sampling strategies and methods, and also notes the roles of qualitative data, such as interviews and focus groups. The workbook that accompanies this textbook includes many additional examples of the research methods and data collection strategies discussed in this chapter.

Finally, this book includes footnotes that serve a variety of purposes. Some of these notes provide additional clarification or examples, and others provide additional depth and detail that expand the material. Readers are encouraged to examine the footnotes. Also, because each social science has its own terminology, and interdisciplinary fields like public and nonprofit management draw professionals from many different sciences, readers will need to become familiar with the analogous terms and concepts they come across. Throughout the book, such analogous terms and concepts are clearly identified as such.