



Quality of Health Care in the United States: A Chartbook

Sheila Leatherman
Douglas McCarthy

The Commonwealth Fund
One East 75th Street
New York, NY 10021-2692

Telephone (212) 606-3800
Facsimile (212) 606-3500
cmwf@cmwf.org
www.cmwf.org



April 2002

Cover photo by Marc Asnin



Quality of Health Care in the United States: A Chartbook

Sheila Leatherman
Douglas McCarthy

Support for this research was provided by The Commonwealth Fund. The views presented here are those of the authors and should not be attributed to The Commonwealth Fund or its directors, officers, or staff.

Copies of this report are available from The Commonwealth Fund by calling our toll-free publications line at **1-888-777-2744** and ordering publication number **520**. The report can also be found on the Fund's website at **www.cmf.org**.

April 2002

Authors

Sheila T. Leatherman	Principal Investigator President, Foundation for Health Care Policy and Evaluation, Minneapolis Adjunct Professor, School of Public Health, The University of North Carolina, Chapel Hill
Douglas B. McCarthy	Research Associate and Editor Argus Insights, Inc., Cedar Crest, New Mexico

Advisory Board

Anne-Marie J. Audet M.D., M.Sc.	Assistant Vice President, The Commonwealth Fund
Donald M. Berwick, M.D., M.P.P.	President and CEO, Institute for Healthcare Improvement
Robert S. Galvin, M.D.	Director, Global Health Care, General Electric Company
Judith H. Hibbard, Dr.P.H.	Professor, Department of Planning, Public Policy, and Management, University of Oregon
Elizabeth A. McGlynn, Ph.D.	Associate Director, RAND Health
William L. Roper, M.D., M.P.H.	Dean, School of Public Health, The University of North Carolina

Production and Dissemination

Paul K. Barry	Director of Communications, The Commonwealth Fund
Susan M. Hayes	Communications Manager, Center for Health Care Policy and Evaluation
Jenise Hudgick	Administrative Coordinator, Center for Health Care Policy and Evaluation
Janine Kennedy	Designer, Argus Insights, Inc.

Contents

Acknowledgements	7
Introduction	9
Chapter 1: Effectiveness	19
Staying Healthy	
Chart 1–1 Childhood Immunizations	25
Chart 1–2 Trend in Immunizations for Older Adults	27
Chart 1–3 Colorectal Cancer Screening	29
Chart 1–4 Trend in Breast Cancer Screening and Outcomes	31
Chart 1–5 Smoking Cessation Counseling	33
Getting Better When Sick	
Chart 1–6 Antibiotic Treatment for Sore Throat	35
Chart 1–7 Antibiotic Treatment for Pneumonia	37
Living with Chronic Illness	
Chart 1–8 Appropriateness of Procedures as Rated by Expert Consensus	39
Chart 1–9 Diabetes Management	41
Chart 1–10 Asthma Management	43
Chart 1–11 Stroke Prevention for Patients with Atrial Fibrillation	45

Chart 1–12	Treatment and Outcomes for HIV	47
Chart 1–13	Medication to Prevent Recurrent Heart Attack	49
Chart 1–14	Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack	51
Chart 1–15	Mental Health Care: Treatment for Depression	53

Long-Term Care

Chart 1–16	Nursing Home Care and Outcomes	55
------------	--------------------------------	----

Chapter 2: Patient Safety 57

Chart 2–1	Estimated Deaths Associated with Medical Mistakes Compared to the Leading Causes of Death in the U.S.	61
Chart 2–2	Preventable Adverse Events and Causes: New York	62
Chart 2–3	Preventable Adverse Events and Outcomes: Colorado/Utah	63
Chart 2–4	Preventable Adverse Drug Events	65
Chart 2–5	Trends and Types of Medication–Prescribing Mistakes	67
Chart 2–6	Potentially Inappropriate Prescribing for the Elderly	69

Chapter 3: Access and Timeliness 71

Chart 3–1	Effect of Being Uninsured on Access to Primary Care	75
Chart 3–2	Effect of Being Uninsured on Access to Preventive Care (Part I)	76
Chart 3–3	Effect of Being Uninsured on Access to Preventive Care (Part II)	77
Chart 3–4	Unmet Needs of Children with Special Health Care Needs	79
Chart 3–5	Effect of Having a Regular Source of Health Care on Access to Preventive Care	81
Chart 3–6	Timely Initiation of Prenatal Care	83
Chart 3–7	Dental Care	85

Chapter 4: Focus on the Patient 87

Chart 4–1	Perceptions of Health Care Quality	91
Chart 4–2	Public Perceptions of the Health Care System	93
Chart 4–3	Consumer Assessment of Health Plans, Overall Ratings	95
Chart 4–4	Consumer Assessment of Health Plans, Ratings of Access and Timeliness	96
Chart 4–5	Consumer Assessment of Health Plans, Ratings of Physician and Health Plan Communications	97
Chart 4–6	Patient Reports of Problems with Hospital Care	99
Chart 4–7	Time Spent with Physician	101
Chart 4–8	Satisfaction with Nursing Home Care	103
Chart 4–9	Ratings of Nursing Home Staff and Staffing Levels	104
Chart 4–10	Nursing Home Quality of Life	105

Chapter 5: Disparities in Health Care 107

Staying Healthy

Chart 5–1	Racial/Ethnic Disparity in Preventive Care	111
-----------	--	-----

Living with Chronic Illness

Chart 5–2	Racial Disparity in Lung Cancer Surgery and Survival	113
Chart 5–3	Racial Disparity in Use of Invasive Heart Procedures	115
Chart 5–4	Gender Disparity in Heart Attack Treatment	117
Chart 5–5	Racial Disparity in Access to Kidney Transplants	119
Chart 5–6	Racial Disparity in Cancer Pain Management	121

Patient Experience

Chart 5–7	Effect of Race/Ethnicity and Language on Parents’ Assessments of Pediatric Care in Medicaid Health Plans . . .	123
-----------	--	-----

Chapter 6: Capacity to Improve	125
Staying Healthy	
Chart 6-1 Improving Immunization Rates	129
Getting Better When Sick	
Chart 6-2 Reducing Unnecessary Antibiotic Use	131
Living with Chronic Illness	
Chart 6-3 Improving Diabetes Management	133
Chart 6-4 Improving Medical Treatment for Heart Attack	135
Chart 6-5 Improving Outcomes of Heart Bypass Surgery	137
Chart 6-6 Improving Treatment and Outcomes for Depression	139
Long-Term Care	
Chart 6-7 Reducing Pressure Ulcers in the Nursing Home	141
Patient Safety	
Chart 6-8 Preventing Medication Mistakes	143
Technical Appendix	145
References	153

Acknowledgements

This Chartbook is a compendium representing the efforts of many different researchers whom we have cited. We are indebted to them for their contributions. We especially wish to thank the authors and other individuals who kindly provided data, sources, and clarifications: Lori Andersen, National Committee for Quality Assurance; Aryne Blumklotz, Foundation for Accountability; Maris Ann Bondi, Partnership for Prevention; Erin Carlson, American Association of Health Plans; Paul Cleary, Harvard Medical School; Lee Hargraves, Center for Studying Health System Change; Charlene Harrington, University of California–San Francisco; Yael Harris and Amy Heller, Centers for Medicare and Medicaid Services; Lucian Leape, Harvard School of Public Health; Timothy Lesar, Albany Medical Center; David Mechanic, Rutgers–The State University; Eric Peterson, Duke University Medical Center; William Rogers, University of Alabama Medical Center; Jonathan Sa’adah, Intermedia Communications; Kimberly Scoles, Harvard School of Public Health; Dale Shaller; Anthony Suchman, Relationship Centered Health Care; Eric Thomas, University of Texas–Houston Medical School; Rick Wade, American Hospital Association; John Wennberg and Megan Cooper, Dartmouth Medical School; and Gooloo Wunderlich, Institute of Medicine.

Members of the Chartbook Advisory Board generously gave their time to provide invaluable advice on content and presentation: Anne–Marie Audet, Donald Berwick, Robert Galvin, Judith Hibbard, Elizabeth McGlynn, and William Roper.

At the Center for Health Care Policy and Evaluation, we thank Susan Hayes for project coordination and review, Thomas Rector for consultation, Steven Wickstrom for statistical advice, and Jenoise Hudgick for administrative support.

At Argus Insights, we thank Janine Kennedy for outstanding design work and Virginia Salas for consultation on infectious disease issues.

We are grateful to Gregg Meyer and Thomas Reilly at the Agency for Healthcare Research and Quality for their encouragement of this project and for helping to ensure that it will complement the goals of the *National Healthcare Quality Report*.

Finally, we acknowledge the financial and moral support of The Commonwealth Fund in making the Chartbook a reality; Karen Davis and Stephen Schoenbaum for their vision in championing the Chartbook; Anne–Marie Audet for her advice and personal interest in overseeing the Chartbook project; and Paul Barry and the communications staff for their logistical support.

Introduction

In America, we are privileged to have access to some of the best health care in the world. Yet the provision of health care is becoming increasingly complex and expensive, with demands on the system likely to grow over time as the population ages and new advances in medicine are introduced. This means that the best use of existing and new resources must be assured, and that the quality of care must be optimized, if we are to realize the potential of our health system.

Serious and widespread problems of quality exist in the United States, with evidence of underuse of beneficial services, overuse of other procedures that are not medically necessary, and mistakes leading to patient injury (IOM 2001a, President's Advisory Commission 1998). The Institute of Medicine of the National Academy of Sciences has stated, "that the quality of health care received by the people of the United States falls short of what it should be" (IOM 2001b).

A common understanding of the magnitude and scope of these problems is needed to provide a framework for communication among the many stakeholders interested in

improving the performance of the American health care system. Such an understanding is essential to garner the necessary resources—in both the public and private sectors—to improve quality. Unfortunately, there is currently no reliable single source providing such a comprehensive and comprehensible picture of the quality of health care in the U.S.

This Chartbook was developed with the hope of filling that gap by creating an authoritative but usable resource to translate what is most important about quality into a format that interested constituencies can easily understand for their decision-making and to provide a platform for public discussion. Our goal is not to create another academic report on quality but rather a tool to educate the public and policymakers on the state of health care quality in the U.S. We have systematically selected a representative range of quality data presented through graphs and narrative to "tell the story" of the problems and successes, and, most importantly, the opportunities to improve health care for the benefit of Americans.

Defining quality: “In the eye of the beholder”

Today, there is growing awareness of the need to improve quality. People legitimately have widely different perceptions of what they consider to be the critical dimensions of quality of care. This kaleidoscope of views on quality largely results from the perspective one adopts as a patient, physician, health care manager, purchaser, payer, or public health official. The same health care encounter may be differently assessed depending upon one’s role—or, in the vernacular, quality is in the eye of the beholder.

- A *physician* is likely to view quality in a technical sense, such as whether an accurate diagnosis is made, whether a surgical procedure is performed proficiently and whether the patient’s health status has improved. This perspective is reflected in the Institute of Medicine’s definition of quality as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (IOM 1990). Measured from this perspective, quality is the gap between what is scientifically sound and possible, and the actual practice and delivery of health services.

- The *patient* is likely to judge his or her encounter with the health care system both by its outcome and through a more personal lens, such as whether the physician listened well, communicated clearly, and was compassionate as well as skilled in delivering care.
- The *health care manager, payer, or purchaser* (health plan, employer, or government program such as Medicare or Medicaid) will want to know if the services are cost-effective—meaning a desired health outcome is achieved in the most efficient and effective manner.
- The *public health official* will wish to know whether health care resources are being used appropriately to optimize population health as well as being provided equitably within the population.

Whether through the eyes of the caregivers or the patients, recent surveys show widespread concerns regarding the eroding performance of the health care system. For example, well over half of U.S. physicians say that their ability to deliver quality care has worsened over the past five years, while little more than half of the American public rates the quality of health care as good or excellent (Blendon and Benson 2001; Blendon et al. 2001; see Chart 4–1). In part, these ratings reflect the very high expectations that Americans have for their health care.

The unique organization and financing of health care in America explains why the World Health Organization (WHO) rates the U.S. as having the most individually responsive health care system in the world, while ranking the U.S. in 37th place overall (among 191 countries) because of the significant disparities that exist between those who have predictable access to health care when needed and those who do not (WHO 2000). Inarguably, there is much to appreciate about our health care system and much to improve upon.

This Chartbook is designed to raise the level of public awareness about critical gaps in quality by portraying where we as a nation have been, where we are today, and where we need to go in seeking to measure and close gaps in the quality of American health care. Regardless of differences in perspective, Americans want a health care system that is safe, effective, efficient, responsive, and available when needed.

What do we know about quality in the U.S.?

We know that American health care is respected worldwide in terms of its training and education, technological sophistication, focus on the consumer, and relative ease of access for those with insurance coverage or ability to pay. We also know the quality problems that exist cannot be cured simply by more money. In fact, the U.S. spends more on health care per capita (\$4,637 in 2000) and as a proportion of the Gross Domestic Product (GDP) than any other nation in the world. National Health Expenditures—which stood at approximately \$1.3 trillion dollars in 2000 or 13 percent of the GDP—are projected to reach \$2.6 trillion dollars by 2010, consuming 16 percent of GDP (Levit et al. 2002; Heffler et al. 2001). We can and should do much better in terms of the way health care is delivered and what is achieved. In some areas, the U.S. is clearly performing more poorly than other countries. One example is the rate of childhood immunizations in the U.S., which tied for 82nd place on its rate of polio vaccination out of 171 countries reporting data in 2000 to the World Health Organization (WHO 2001).

It is clear that improvement in six areas of performance could significantly affect the process and outcomes of health care: (1) consistently providing appropriate and effective care, (2) reducing unjustified geographic variation in care, (3) eliminating avoidable mistakes, (4) lowering access barriers, including lack of insurance, (5) improving responsiveness to patients, and (6) eliminating racial/ethnic, gender, socioeconomic, and other disparities and inequalities in access and treatment. A brief overview of each area is listed below.

Appropriate and effective treatment and prevention for acute and chronic disease

In the U.S., studies published in leading medical journals consistently report findings that people with acute and chronic medical conditions receive only about two-thirds of the health care that they need while 20 percent to 30 percent of the tests and procedures provided to patients are not needed or beneficial (Schuster, McGlynn, and Brook 1998). This is described as a quality problem of overuse and underuse. For example, physicians continue to prescribe antibiotics for the common cold even though the evidence is clear that antibiotics are ineffective—this is overuse. And in more complex conditions such as heart disease, medications such as beta-blockers that are known to be effective in preventing the recurrence of a heart attack are not prescribed—this is underuse (see Chart 1–13). In numerous other clinical situations, even when the most effective treatment processes

are known and agreed upon, the care does not reflect good science. Representative cases include treatment for pneumonia (see Chart 1–7), diabetes (see Chart 1–9), and others presented graphically in Chapter 1.

Geographic variation

The last several decades have produced a large amount of evidence that there are significant variations in the use of medical treatments and procedures, even for patients whose symptoms and illness are similar (Wennberg and Gittelsohn 1973; Wennberg and Cooper 1999). Surgical rates vary dramatically from one region of the country to another, as illustrated in another chartbook, the *Dartmouth Atlas on Health Care Quality in the U.S.* (Wennberg and Cooper 1999). This quality problem of unjustified variation reflects a failure to consistently practice in accordance with the scientific evidence and professional expert consensus, as well as a lack of clear evidence in some situations on what approach works best. Unjustified variation not only has potential implications for patient outcomes, but also constitutes mismanagement of resources. For example, physicians in Texas are more likely to perform invasive heart procedures than physicians in New York; however, the outcomes are not any better for the Texas patients (Guadagnoli et al. 1995).

Medical mistakes

The number of deaths related to medical mistakes was estimated to be 44,000–98,000 annually according to the Institute of Medicine (IOM 2000). Although other studies have questioned these numbers, few dispute the importance of the problem. Medical mistakes exist in rare situations such as amputation of the wrong limb, or much more common but potentially more lethal situations of prescribing contraindicated drugs or a drug overdose. Advancements in medicine actually may lead to more opportunities for error, such as an increase in medication mistakes as more drugs are used (see Chart 2–5). Chapter 2 illustrates this dimension of quality in further detail.

Access issues

Access problems are many and diverse. Lack of insurance is a major reason for not obtaining access to care when and where needed. Those without insurance coverage are less likely to obtain needed medical care and preventive tests (see Charts 3–1 to 3–4). These and other issues, such as lack of an established relationship with a doctor are illustrated in Chapter 3. But even with insurance, people may not be able to obtain care because of barriers in language, culture, transportation, or geography. For example, a family may have insurance coverage but not be able to navigate the health care system because they do not speak English (see Chart 5–7). Likewise, merely having insurance coverage is not sufficient if an individual requires specialist care that is not geographically available.

Responsiveness/patient-centered care

Quality from a patient's view does not relate only to technical proficiency and skill. Respect, dignity, autonomy, kindness, and convenience are also critical from a patient's perspective and constitute important elements of quality to the public. A great deal of activity is now focused on providing information to patients enabling them to make better informed decisions when selecting where to get health care (what physician, clinic, HMO, etc.), as well as how to participate more actively in treatment choices. Research has shown that patients do use and make prudent decisions when given good information that is tailored to their needs (Coulter 2001). Chapter 4 illustrates how patients' perceptions relate to their experience with health care in various settings.

We also must pay particular attention to the quality of care for vulnerable populations, such as nursing home residents. These patients are sometimes overlooked, but their problems can be serious, even tragic. A recently published survey showed generally positive views from people that have a friend or family member in a nursing home. However, a significant minority indicate that they, or a person they know, received poor-quality care, with about one-quarter reporting incidents of abuse or poor treatment by staff (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health 2001; see Charts 4–8 to 4–10).

Disparities and inequalities

Issues related to quality affect the entire U.S. population, but not equally. Research reveals disparities in treatment received by certain parts of the population. For example, there is significant race, gender, and socioeconomic variation in the rates of medical procedures. In general, the evidence shows that minorities, as defined by race and ethnicity, are less likely to receive routine medical procedures. For example, African-Americans are less likely to receive cardiac treatment and are also less likely to receive kidney transplantation when suffering from end stage renal disease (Kressin and Petersen 2001; Epstein et al. 2000; see Charts 5–3 and 5–5). These and other disparities are illustrated in Chapter 5.

The way forward: What can be done to improve quality?

Quality will not simply improve over time. In fact, challenges to quality are likely to escalate due to growth in the aging population, which will lead to more serious and chronic illness, increased public demand, and continued resource constraints. Historically, quality has largely been addressed through professional registration and licensure, accreditation of hospitals, and the less formal professional peer review processes. While these traditional methods of quality management are important and need to continue, new approaches to improving performance will depend on both better diagnosis of the problems and implementation of effective corrective

strategies. A key lesson from other industries is that most quality problems can be traced to flawed systems, lack of proper training, and perverse incentives that hinder people from performing optimally. Long-term restructuring programs to build knowledge, standardize processes, redesign systems, and reward good performance will be needed. Chapter 6 portrays examples of quality improvement initiatives that have been effective for improving patient care and responsiveness.

Enhancing knowledge

Closing the gap between what is scientifically known and the practice patterns of health providers is not simply a matter of exhorting everyone to work better and harder. With thousands of clinical research trials under way, the sheer volume of the medical literature makes it humanly impossible for physicians to master all the emerging new knowledge. This is true not only for new and complicated medical treatments such as cancer care but even the most routine ones, such as treatment of sore throats. For example, evidence-based guidelines can help physicians determine the best course of treatment for sore throat since it is usually caused by a virus and will resolve on its own, rendering antibiotic treatment useless in all but the small minority of cases that are likely to be caused by bacterial infection (see Chart 1–6). Therefore, methods and systems to support the best of medicine, such as systematic reviews of the literature, guidelines, and computerized practice prompts, need to be routinely implemented.

Making information on quality available

One reason for the uneven quality of health care is the lack of systematic reliable reporting that objectively describes the nature of the problem and monitors progress. That gap may be addressed, in part, by *The National Healthcare Quality Report*, mandated by Congress to be published annually by the Agency for Health Care Research and Quality (AHRQ) starting in 2003. In 1999, the U.S. Congress requested that a *National Disparities Report* be published annually by AHRQ. It will be a complement to *The National Healthcare Quality Report*. *The National Disparities Report* will describe disparities as they relate to socioeconomic and racial factors in the areas of access, utilization and quality of health care services.

As important as these national level reports will be, it is important to note that quality takes place at the front lines, where the patient and health care provider interact. It is at this level that fair and useful quality measurement and feedback needs to take place, allowing caregivers, hospitals, and health care systems to understand where improvement is needed. Fortunately, there is evidence that organizations and systems of care will use performance data to improve processes of care, identify and deal with individuals who are poor performers, and make changes in response to consumers' complaints (Marshall, Shekelle, Leatherman, et al. 2000).

Increasingly, the individual patient is also regarded as an important audience of quality data. For example, in November 2001, the federal government launched a new quality initiative to help people (and their families) who rely on Medicare and Medicaid programs to find the best nursing homes for their needs. Consumers will be able to compare the quality of facilities on eleven different quality measures online. Similarly detailed comparisons of other types of health care institutions including home care agencies and hospitals will also be available in the future, according to the federal government (DHHS 2001).

Improving quality through coverage

The title of a recently published report from the Institute of Medicine says it succinctly: "Coverage Matters." Though the subject of this chartbook is quality of health care services delivered in America, it would be remiss not to mention the quality implications for the large number of uninsured in America. Many people who lack insurance tend to forgo health care until their medical situation becomes intolerable. About 39 million Americans, or 14 percent of the population, were without insurance coverage for all of 2000, according to the U.S. Census Bureau. Four-fifths of the uninsured are children and adults in working families. Among employees, those who work for small companies are more likely not to have insurance because small employers say they are unable to afford the high premiums for their workers (IOM 2001c).

Rewarding quality

Performance needs to be evaluated and reinforced. Attempts to exploit consumer market forces have had only a marginal effect to date and the need to implement incentives is increasingly recognized. Pay for performance is a concept of interest in both publicly financed and private-pay health systems. The judicious use of incentives requires careful design in two ways: the reinforcement of positive performance and the removal of mechanisms that adversely affect performance. Incentives may be of either a financial or non-financial nature. For example, a coalition of large New York corporations, on behalf of more than 100,000 employees, will pay cash incentives to hospitals that meet certain safety requirements such as having intensive care specialists on staff and implementing computerized physician ordering systems to reduce prescribing mistakes (Freudenheim 2000). Non-financial incentives may include more innovative and potentially effective mechanisms such as reductions in oversight and intrusive administrative decisions, as well as professional and institutional recognition.

Conclusion

Quality is a challenging issue, defined differently by various stakeholders and impacted on many levels—from the complexity of large organizations to the dynamics of interpersonal relationships. Even with the multitude of perspectives, there is little argument that Americans are increasingly concerned about effectiveness, responsiveness, and access to health care. Information about quality is necessary to identify the priority areas, create a common understanding of the gaps, and point to reasonable strategies for improving the American health care system.

Sheila Leatherman
Minneapolis, Minnesota

Douglas McCarthy
Durango, Colorado

Notes on format and content

Organization: The organization of data presented in this Chartbook generally follows the framework recommended by the Institute of Medicine for *Envisioning the National Health Care Quality Report* (IOM 2001b). We depart from that framework in certain respects where we felt it beneficial or necessary due to constraints imposed by the available published data and the imperative to highlight certain issues such as access and disparities.

Sources of data: We selected charts based on considerations of strength of data, balance, and relevance for a lay audience. In most cases, the data displayed in charts has been derived from published studies or from the reports of government agencies or research institutions. We conducted a focused Medline search by disease/condition based on a previous literature review by RAND (Schuster, McGlynn, and Brook 1998) and bibliographies compiled for other relevant reports such as those of the Institute of Medicine (IOM 2000; 2001a; 2001b), the President's Advisory Commission (1998), the Medicare Health Care Quality Improvement Initiative (CMS 2000), and Healthy People 2010 (DHHS 2000).

Significance: We generally show only results that are statistically significant, where significance has been reported (i.e., 95 percent confidence or greater that differences are not due to random chance). In other cases, we report on what we considered meaningful results.

State data: State-specific data typically includes the 50 states plus the District of Columbia. We have omitted Puerto Rico data where it was included in original sources of state-specific results, since differences in the organization and financing of health care make comparisons between Puerto Rico and the States problematic. In some cases, a U.S. average was reported. In other cases, we have calculated a median. The median represents the middle value (middle of the range) when the state rates are ordered from lowest to highest.

Race/ethnicity: We report data on race and ethnicity generally following the usage from the original study or survey (e.g., black or African-American), recognizing that people have different preferences. Due to limited space, we were generally unable to report fully on gender, socioeconomic, and geographic disparities.

Please see the Technical Appendix for a more detailed explanation of sources and methodology.

Chapter 1

Effectiveness

Effectiveness is probably the component of health care most readily identified because ultimately it represents the “bottom line,” that is, whether care leads to improved outcomes in terms of health status and quality of life for patients.

—Institute of Medicine, 2001b

Chapter 1

Effectiveness: Introduction

Effectiveness means “*providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit*” (IOM 2001b). The quality measures included in this chapter represent a variety of common diseases or conditions, organized to depict three consumer perspectives on health care:

- **Staying healthy** means getting help to avoid illness and remain well. This entails preventive care such as immunizations to prevent infectious diseases, cancer screenings to promote early detection and treatment of disease, and counseling on healthy behaviors.
- **Getting better** means getting help to recover from an illness or injury, such as appropriate antibiotic treatment for sore throats or pneumonia.
- **Living with chronic illness** means getting help managing an ongoing condition such as diabetes. This often entails getting patient education, proper medication management, and regular follow-up care to prevent complications.

The data show some striking improvements over time:

- a doubling in rates of flu shots for older adults and mammography among women (Charts 1–2 and 1–4),

- a 44 percent increase in appropriate antiretroviral therapy among adults with HIV (Chart 1–12),
- one-third faster treatment of heart attack victims with clot-dissolving drugs in some hospitals (Chart 1–14), and
- a 50 percent reduction in the use of physical restraints among nursing home facilities (Chart 1–16).

Yet, substantial deficits remain in many areas:

- Less than half of adults age 50 and over are screened for colorectal cancer as recommended (Chart 1–3).
- Antibiotics are overused to treat sore throats but not used quickly enough to treat pneumonia (Chart 1–6 and 1–7).
- One-third of common surgical procedures are performed for inappropriate reasons or have questionable benefits for patients (Chart 1–8).
- Up to three-quarters of adults with diabetes do not receive recommended care (Chart 1–9).
- Up to half of older hospital patients who would benefit from medications to prevent strokes and recurrent heart attacks do not get these drugs (Charts 1–11 and 1–13).

Effectiveness: Summary of Charts and Findings

Chart 1-1: Childhood Immunizations—Over one-quarter of young children were not up-to-date on five key immunizations nationally in 2000.

Chart 1-2: Trend in Immunizations for Older Adults—More older adults (age 65 and over) received vaccinations to prevent influenza and pneumonia as recommended over the past decade, but one-third to one-half still do not receive these potentially life-saving vaccinations.

Chart 1-3: Colorectal Cancer Screening—In 1999, less than half of adults age 50 and over had received recommended tests that are effective in reducing premature deaths from colorectal cancer.

Chart 1-4: Trend in Breast Cancer Screening and Outcomes—Use of mammography more than doubled over the past decade. Breast cancer mortality declined 15 percent during this time due to both earlier detection and better treatment.

Chart 1-5: Smoking Cessation Counseling—Physicians fail to provide smoking cessation counseling during over three-quarters of all visits by smokers, including one-half or more of visits for smoking-related health problems.

Chart 1-6: Antibiotic Treatment for Sore Throat—

Primary care physicians moderated their use of antibiotics to treat sore throats in 1999, but antibiotics continue to be overused at a rate well above what clinical guidelines suggest is appropriate.

Chart 1-7: Antibiotic Treatment for Pneumonia—

In half the states, more than 14 percent of Medicare beneficiaries hospitalized with pneumonia did not receive timely and appropriate antibiotic care during 1998–1999.

Chart 1-8: Appropriateness of Procedures as Rated by Expert Consensus—

Over the past two decades, several studies have found that about one-third of surgical procedures were performed for inappropriate reasons or had questionable benefit for patients.

Chart 1-9: Diabetes Management—Up to three-quarters of adults with diabetes did not receive recommended care from their health care practitioner in the middle-range state during 1997–1999, and over one-half did not perform recommended self-care.

Chart 1–10: Asthma Management—Over one-third of children and adults with persistent asthma enrolled in managed health care plans did not receive appropriate medications for long-term asthma control in 2000.

Chart 1–11: Stroke Prevention for Patients with Atrial Fibrillation—In half the states during 1997–1999, 45 percent (or more) of hospitalized Medicare patients with irregular heart beat did not receive blood thinning drugs to reduce their risk of having a stroke.

Chart 1–12: Treatment and Outcomes for HIV—There was a 44 percent increase in highly active antiretroviral therapy for adult patients with HIV from 1996 to 1998, with fewer adverse outcomes. Still, one-half of HIV patients did not have satisfactory care and outcomes.

Chart 1–13: Medication to Prevent Recurrent Heart Attack—In half the states during 1998–1999, over one-quarter of eligible Medicare heart attack patients did not receive medication that is effective in preventing recurrent heart attacks and improving long-term survival.

Chart 1–14: Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack—Selected hospitals reduced the time to start treatment with clot-dissolving drugs that restore blood flow to the heart muscle by nearly 40 percent, but further improvement is needed to reach the national goal of 30 minutes.

Chart 1–15: Mental Health Care: Treatment for Depression—More patients with depression received anti-depressant medication in a 1996–1997 study than in a similar 1986 study, but a significant proportion of people did not receive effective treatment.

Chart 1–16: Nursing Home Care and Outcomes—The use of physical restraints declined by half among nursing homes from 1994 to 2000, suggesting improved quality. The prevalence of pressure ulcers (bed sores) changed only slightly from 1994 to 2000, indicating a need for further improvement.

Effectiveness: Staying Healthy

Childhood Immunizations

Why is this important? Vaccination is one of the most cost-effective disease prevention strategies in public health. Vaccination also protects against mild illnesses that result in absence from school and lost workdays for parents. High vaccination levels must be achieved to protect children against periodic outbreaks of infectious disease. For example, a measles epidemic in 1989–1991 resulted in 11,000 people being hospitalized, 120 deaths, and \$100 million in medical costs (DHHS 2000). More recently, nearly 8,000 cases of pertussis were reported in 2000, resulting in 62 deaths (CDC 2002a).

Findings: Over one-quarter of young children age 19 to 35 months were not fully up-to-date on all recommended doses of five key vaccines nationally in 2000. Among the states, coverage rates ranged from a low of 64 percent in Texas to a high of 83 percent in Iowa and North Carolina. Source: National Immunization Survey (CDC 2001a).

The vaccines included in this combined series (and their specific rates of coverage in 2000) are: diphtheria-tetanus-pertussis or diphtheria-tetanus (82%), poliovirus (90%), a measles-containing vaccine (91% for the measles-mumps-rubella vaccine), *Haemophilus influenzae* type b (93%), and Hepatitis B (90%). The new Varicella (chicken pox) vaccine—which is not included in this combined series—achieved 68 percent coverage in 2000 (CDC 2001a).

Implications: The United States lags behind other nations in achieving widespread vaccination of children. For example, the U.S. tied for 65th place out of 164 countries worldwide on rates of coverage with three doses of diphtheria-tetanus-pertussis vaccine in 2000 (WHO 2001). Immunization rates have risen over the past decade due to expanded public and private financing and improvement initiatives. Further improvement will require ongoing education as well as better monitoring and reminder systems to reduce missed opportunities for vaccination (CDC 2001a; see Chart 6–1).

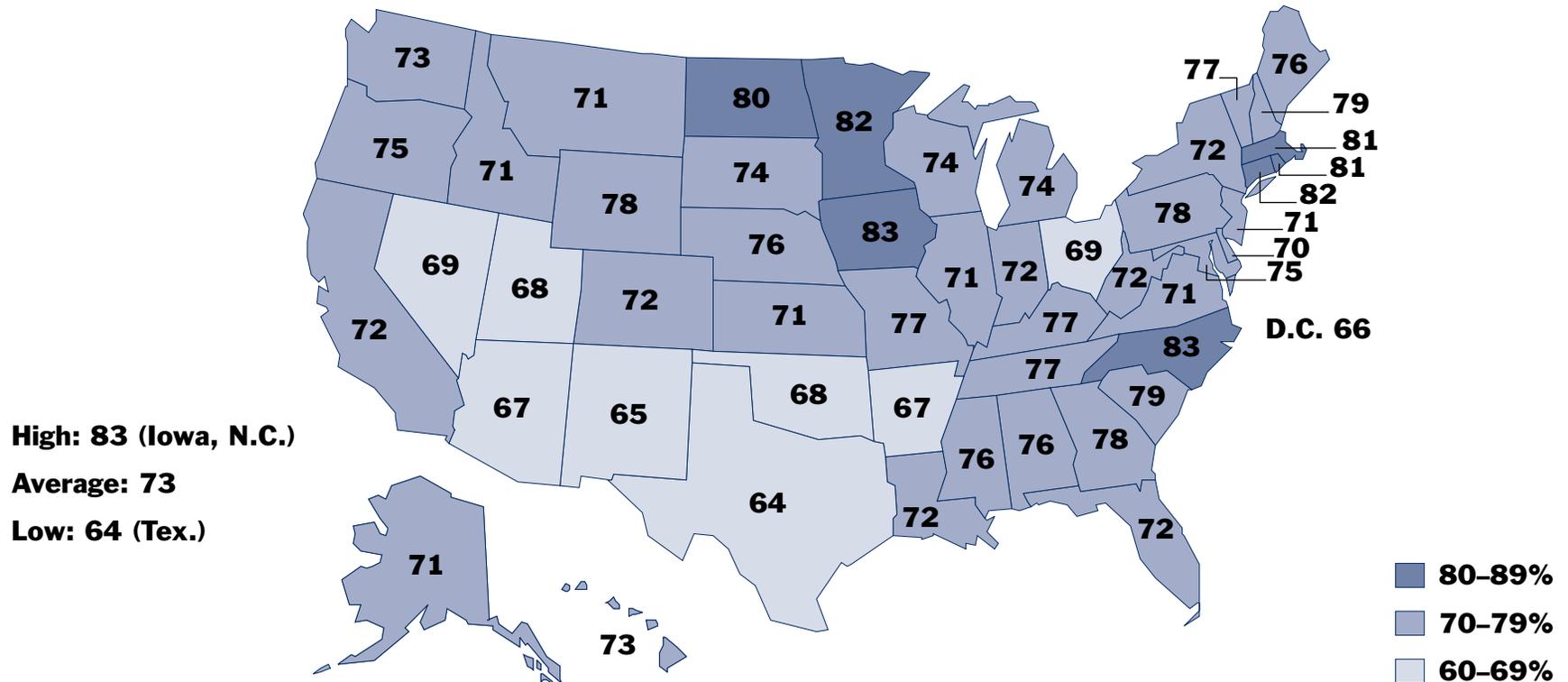


Chart 1-1

Childhood Immunizations

Over one-quarter of young children were not up-to-date on their immunizations nationally in 2000.

Percent of children age 19–35 months who received all recommended doses of five key vaccines



Source: National Immunization Survey (4:3:1:3:3 combined series) (CDC 2001a). U.S. data includes the 50 states and the District of Columbia (D.C.).

Effectiveness: Staying Healthy

Trend in Immunizations for Older Adults

Why is this important? Pneumonia and influenza are the seventh leading cause of death in the U.S. Influenza claims over 20,000 lives annually. Pneumococcal disease accounts for 500,000 cases of pneumonia and 40,000 deaths annually, more than any other vaccine-preventable bacterial disease. Wider vaccination against these diseases could prevent many premature deaths, doctor visits, and hospitalizations—and is especially prudent considering the threat of antibiotic-resistant bacteria (CDC 1997; CDC 2001b).

Public health experts recommend annual influenza vaccination for older adults, those at increased risk of complications from influenza, and health care workers or others who could spread influenza to those at risk. A single pneumococcal vaccination is recommended for older adults and others who are at increased risk of illness and/or death from pneumococcal disease. Medicare has paid for both the cost and administration of these two vaccines since 1993 (CDC 1997; CDC 2001b).

Findings: From 1989 to 1999, the proportion of adults (age 65 and over) who received an influenza vaccination in the past year doubled, while the proportion that ever received a vaccination against pneumococcal disease more than tripled. Still, one-third to one-half were not vaccinated as recommended in 1999. Source: National Health Interview Survey (CDC 1995; CDC 2000a; CDC 2002b).

Implications: The main reasons seniors say they do not get these vaccines are not knowing they are needed, misperceptions about the vaccine, lack of a doctor's recommendation, or forgetting (CDC 1999). In response, public health experts recommend that health care providers use every opportunity to educate and offer these vaccines to patients when indicated. Standing orders programs, which authorize nurses and pharmacists to administer vaccines according to a physician-approved protocol, have been shown effective and are recommended for nursing homes, hospitals, and other institutional providers (CDC 2000b).

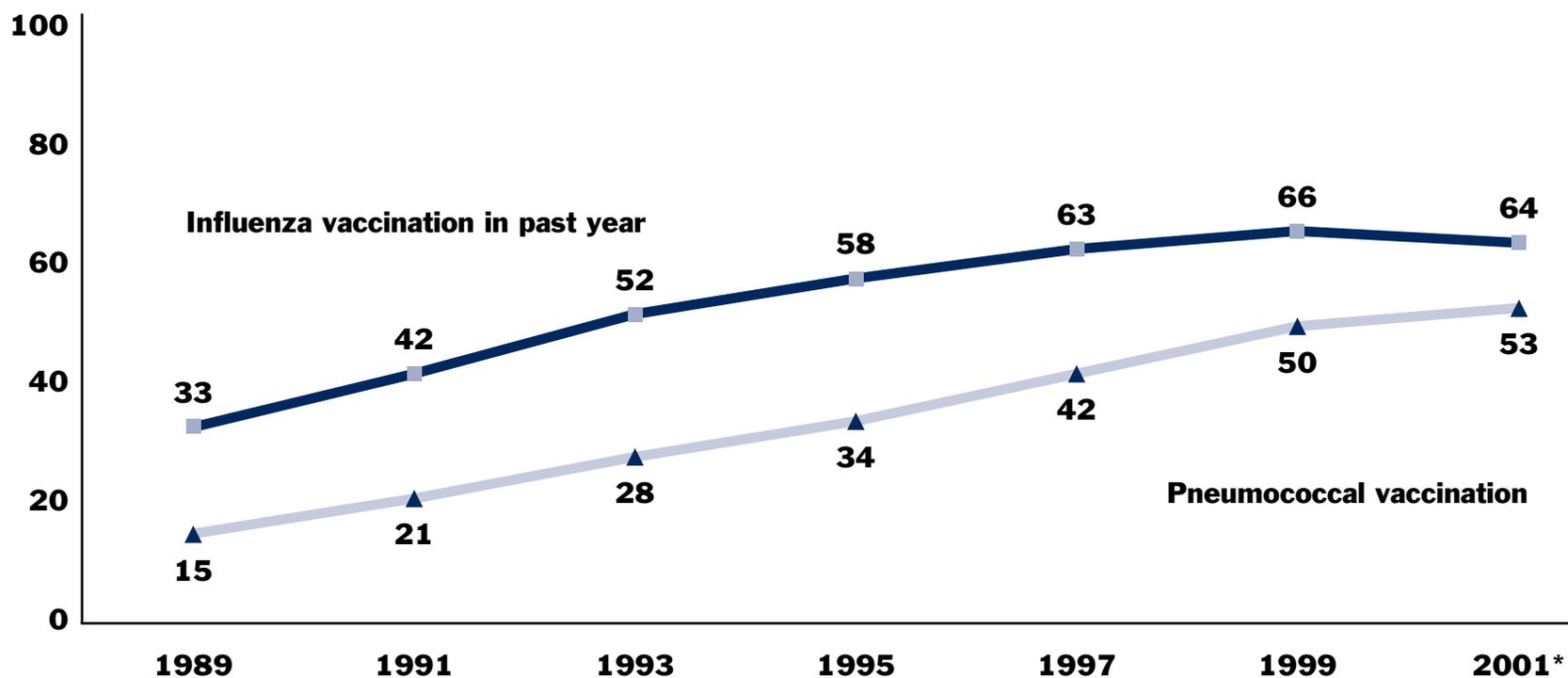


Chart 1-2

Trend in Immunizations for Older Adults

More older adults (age 65 and over) were vaccinated as recommended over the past decade, but one-third to one-half still do not receive these potentially life-saving vaccinations.

Percent of adults age 65+



Source: National Health Interview Survey (CDC 1995; CDC 2000a; CDC 2002b). *Preliminary data (January–June early release).

Effectiveness: Staying Healthy

Colorectal Cancer Screening

Why is this important? Colorectal (colon or rectum) cancer is the second most common cause of cancer death in the U.S., claiming 56,000 lives each year and reducing life by 13 years on average (USPSTF 1996; ACS 2001). Experts recommend the following screening for adults age 50 and over to detect polyps or cancers at an earlier and more treatable stage, which can reduce deaths from colorectal cancer by one-third or more (AGA 1997; AMA 2001):

- fecal occult blood test every year (to detect blood hidden in the stool), and/or flexible sigmoidoscopy every five years (a thin, lighted tube is used to visually inspect the rectum and the lower part of the large intestine), or
- total colon examination by colonoscopy every 10 years (similar to sigmoidoscopy, except the doctor can inspect the rectum and the entire large intestine), or by double-contrast barium enema every five to 10 years (an X-ray examination of the rectum and the entire large intestine).

Findings: In 1999, only 21 percent of adults age 50 and over reported having a fecal occult blood test in the past year, and 40 percent had ever had such a test. Likewise, just 34 percent reported that they had a sigmoidoscopy or colonoscopy in the past five years, and 44 percent had ever had such a test. Overall, 44 percent had *either* a fecal occult blood test in the past year *or* sigmoidoscopy/colonoscopy in the past 5 years. Rates of screening were relatively low even in the best performing states. Source: Behavioral Risk Factor Surveillance System (CDC 2001c).

Implications: Screening for colorectal cancer remains widely underused and has not yet garnered the public attention devoted to other cancers. Reasons for underuse may include lack of knowledge about colorectal cancer and the effectiveness of screening, potential cost barriers (Medicare began paying for these tests for screening purposes in 2001), embarrassment or perceptions that the tests are uncomfortable, or lack of a physician recommendation. Rates of screening are higher when these tests are recommended by a physician (AGA 1997).

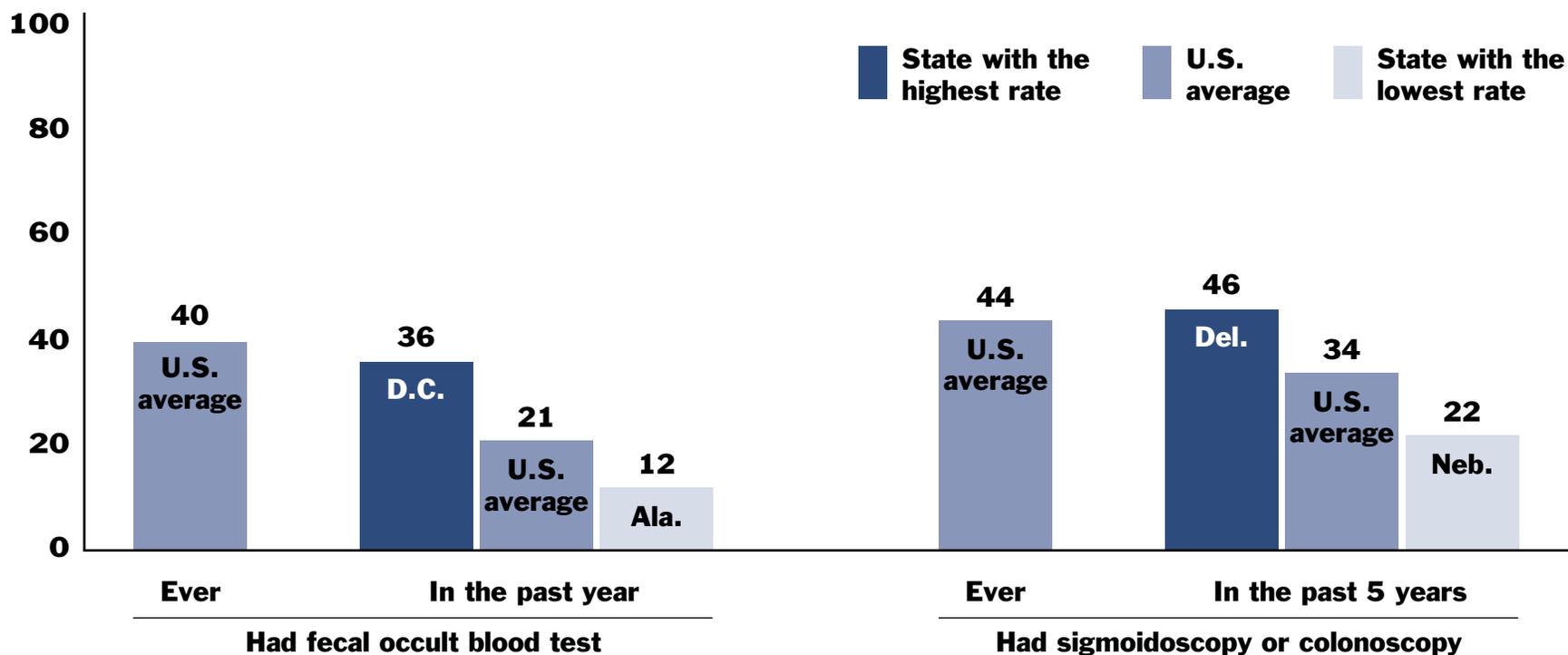


Chart 1-3

Colorectal Cancer Screening

In 1999, less than half of adults age 50 and over had received recommended tests that are effective in reducing premature deaths from colorectal cancer.

Percent of adults age 50+



Source: Behavioral Risk Factor Surveillance System (CDC 2001c). U.S. data include the 50 states plus the District of Columbia (D.C.).

Effectiveness: Staying Healthy

Trend in Breast Cancer Screening and Outcomes

Why is this important? Breast cancer is the most commonly diagnosed, non-skin cancer among U.S. women, with over 190,000 new cases and 40,000 deaths annually (ACS 2001). Breast cancer victims lose 19 years from their normal life span on average (Brown, Lipscomb, and Snyder 2001).

Breast cancer screening includes breast self-examination, clinical breast examination by a physician or nurse, and mammography. Mammography is a low-dose X-ray of the breast that can detect breast cancer at its earliest and most treatable stage, before a lump can be felt. Routine mammography reduces death from breast cancer by 17 percent to 23 percent when the results of research studies are pooled together. There has been controversy regarding the age at which routine mammography should begin. Many expert bodies, including the U.S. Preventive Services Task Force, now recommend mammography every one to two years starting at age 40, although the evidence is strongest for screening women age 50–69 (USPSTF 2002). This chart shows screening starting at age 50 to reflect the consensus of recommendations during the time period measured.

Findings: The rate of mammography more than doubled from 1987 to 1998. Still, three out of 10 women age 50 and over had not obtained a mammogram in the past two years in 1998. Breast cancer death rates declined 15 percent from 1985 to 1998, most likely as a result of both earlier detection and better treatment (ACS 2001). Source: National Health Interview Survey (MacKay, Fingerhut, and Duran 2000) and Vital Statistics of the U.S. (Eberhardt et al. 2001).

Implications: Increases in mammography rates reflect initiatives such as the National Breast and Cervical Cancer Early Detection Program, private-sector quality improvement programs, better insurance coverage, and widespread public attention to this issue. Important factors are a physician's recommendation that a woman have a mammogram as well as a woman's participation with her doctor in the decision to be screened (Phillips et al. 1998).

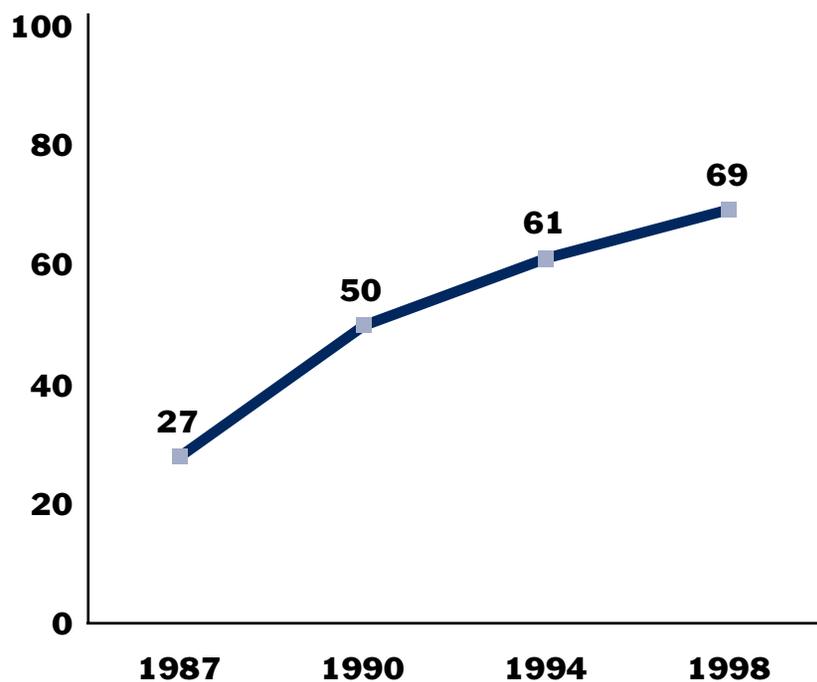


Chart 1-4

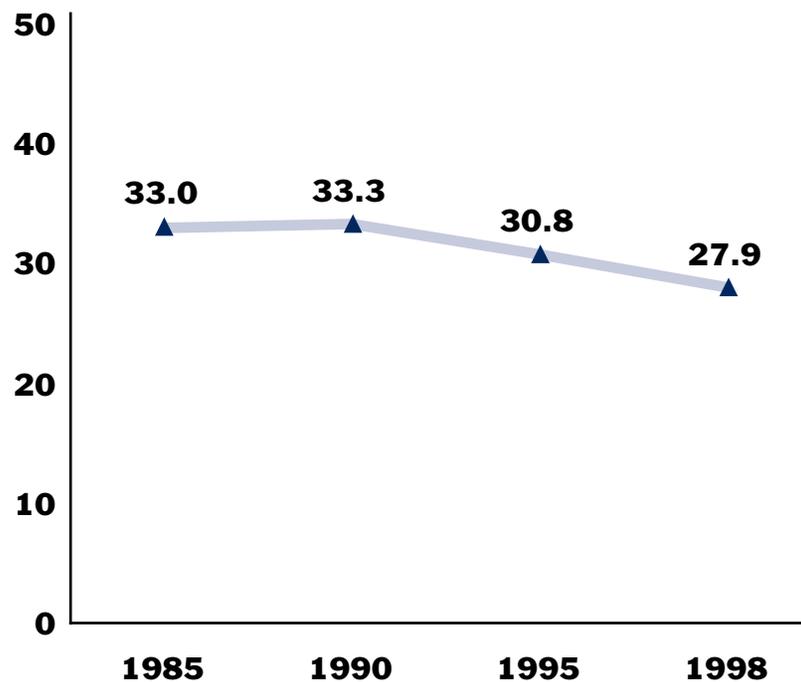
Trend in Breast Cancer Screening and Outcomes

Use of mammography more than doubled over the past decade. Breast cancer mortality declined 15 percent during this time due to both earlier detection and better treatment.

Percent of women age 50+ who had a mammogram in the past two years



Outcome: Breast cancer death rate (per 100,000 women, all ages)



Source: National Health Interview Survey (MacKay, Fingerhut, and Duran 2000), Vital Statistics of the U.S. (Eberhardt et al. 2001).

Effectiveness: Staying Healthy

Smoking Cessation Counseling

Why is this important? Nearly one-fourth of adults and one-third of high school students smoke cigarettes. Smoking is the most preventable cause of disease and death in the U.S. (DHHS 2000). Smokers who quit reduce their risk of death from heart disease by one-half after one year and their risk of lung cancer by up to one-half after 10 years. Pregnant women who stop smoking have better birth outcomes (USPSTF 1996).

Many health promotion organizations recommend that physicians counsel smokers to stop smoking. Physicians interact with over two-thirds of smokers during regular medical care. Controlled studies have found that physician counseling increases abstinence rates, especially when there is consistent and repeated advice from several physicians; even higher quit rates are achieved when counseling pregnant women and patients with heart disease (USPSTF 1996).

Findings: Although physicians regularly identify their patients' smoking status, they counsel patients to stop smoking much less often: at less than one in four visits by adults who smoke and one in six visits by adolescent smokers. Even when they are visiting for smoking-related health problems, one-half or more of smokers do not receive smoking cessation counseling. Source: National Ambulatory Medical Care Survey (Thorndike et al. 1998, Thorndike et al. 1999.)

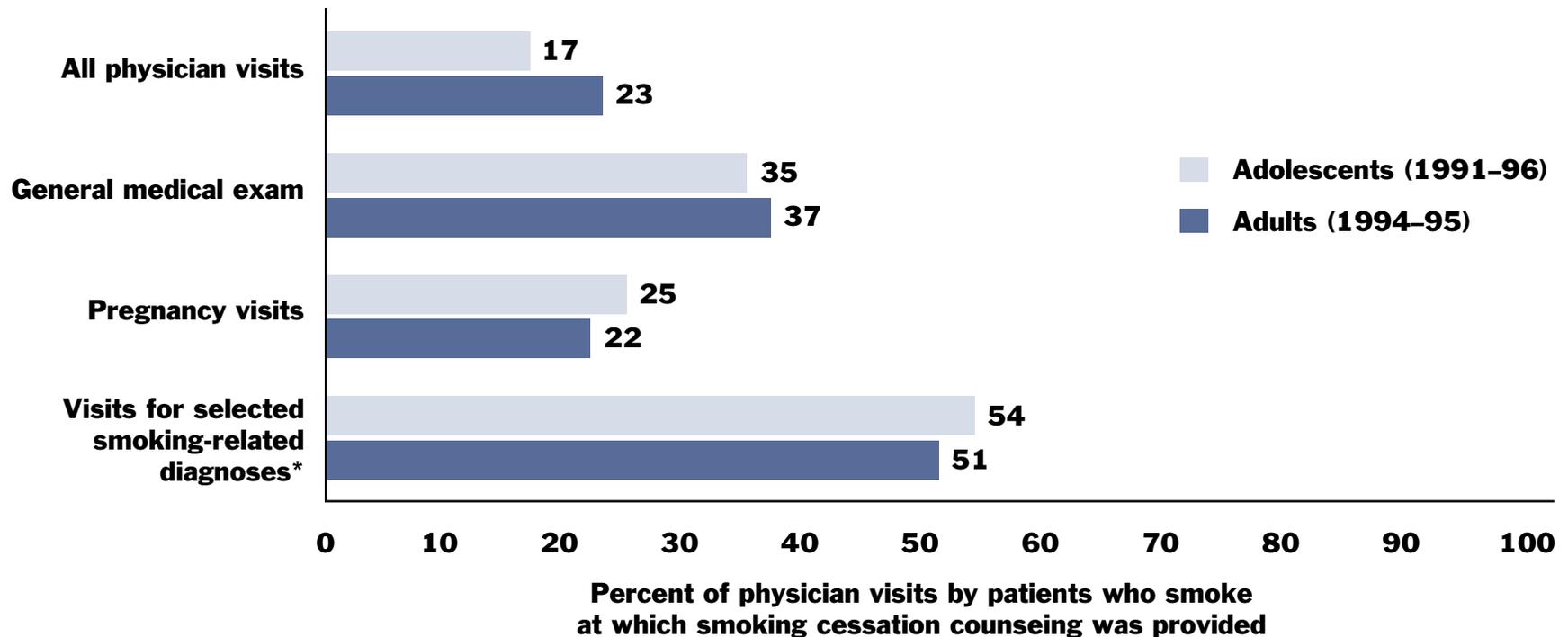
Implications: Even a small improvement in smoking cessation can have a substantial impact in reducing the burden of disease associated with smoking. Physicians currently miss many opportunities to counsel patients about smoking cessation. Physicians say that they often do not have enough time to provide more consistent counseling on behavioral risk factors due to a lack of reimbursement for such services (DHHS 2000). Additional training and support for counseling services may be needed to help physicians improve this performance.



Chart 1-5

Smoking Cessation Counseling

Physicians fail to provide smoking cessation counseling during over three-quarters of all visits by smokers, including one-half or more of visits for smoking-related health problems.



Source: National Ambulatory Medical Care Survey (adapted with permission from Thorndike et al. 1998, Copyrighted 1998, American Medical Association; and by permission of Oxford University Press from Thorndike et al. 1999). *Note: Smoking-related diagnosis is the highest rate achieved among adults (Chronic Obstructive Pulmonary Disease) and adolescents (Lower Respiratory Tract Infection).

Effectiveness: Getting Better When Sick

Antibiotic Treatment for Sore Throat

Why is this important? Sore throat is one of the most common reasons for adults to visit a doctor. Most sore throats are caused by a viral infection, against which antibiotic treatment is not effective. Widespread over-prescribing of antibiotics has led to the emergence of new strains of bacteria that are resistant to treatment with antibiotics. To combat the spread of antibiotic-resistant infections, public health experts and physician specialty societies recommend careful antibiotic use for patients who are most likely to benefit (Cooper et al. 2001).

Findings: Primary care physicians have recently moderated the use of antibiotics to treat adults with sore throats, prescribing them during 57 percent of patient visits in 1999 compared to 82 percent of visits in 1991. Still, antibiotics continue to be prescribed at a rate well above what clinical guidelines suggest is necessary. Source: National Ambulatory Medical Care Survey (Linder and Stafford 2001).

Implications: The large difference between the prevalence of “strep” infection among adults with sore throats (5–17%) and the proportion of such patients receiving antibiotic treatment (57% in 1999) suggests that antibiotics continue to be overused among these patients. Treatment based on clinical guidelines would reduce antibiotic use to a rate of 11–33 percent of adult patients with sore throat (Cooper et al. 2001). Research in Finland shows that decreasing the use of antibiotics leads to a decrease in the prevalence of antibiotic-resistant bacteria in the community (Seppala et al. 1997). See Chart 6–2 for an example of a multi-faceted intervention that safely reduced antibiotic use at one health plan.

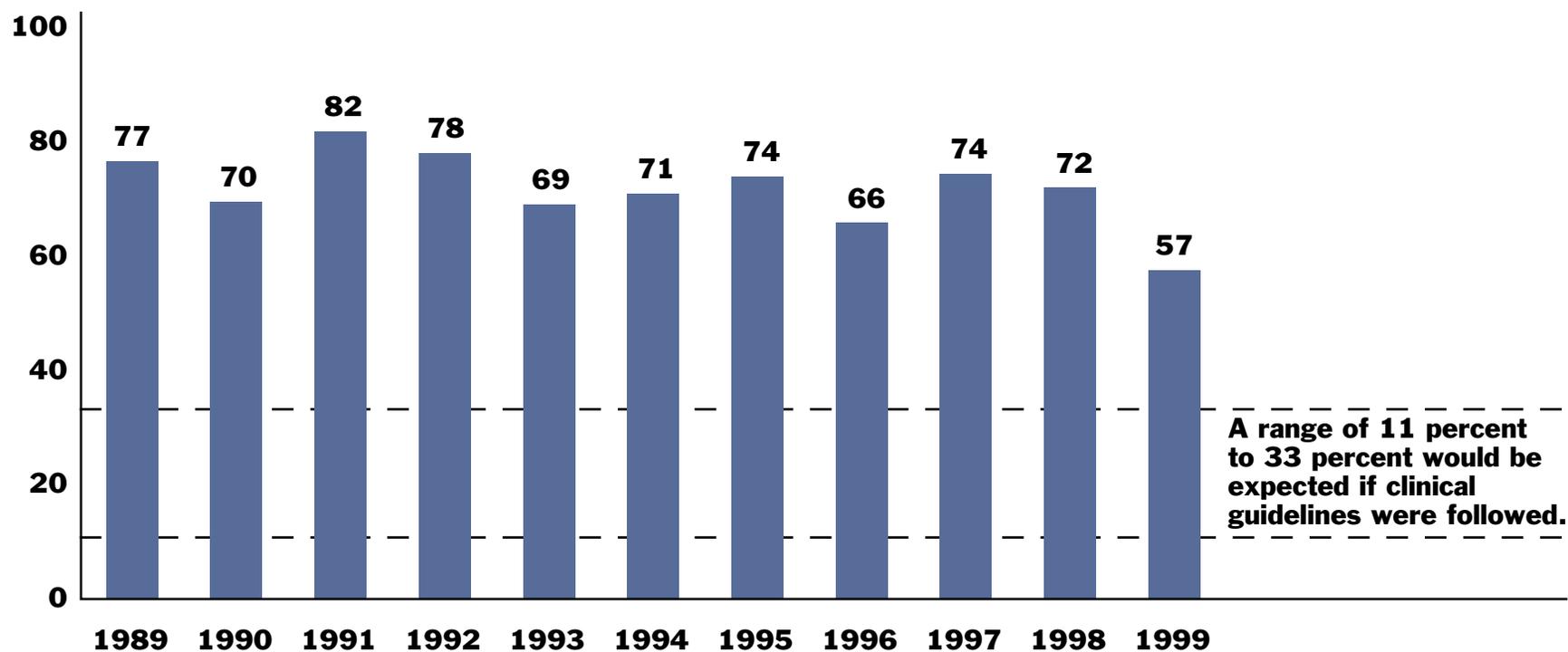


Chart 1-6

Antibiotic Treatment for Sore Throat

Primary care physicians moderated their use of antibiotics to treat sore throats in 1999, but antibiotics continue to be overused at a rate well above what clinical guidelines suggest is appropriate.

Percent of primary care patient visits by adults with sore throat at which an antibiotic was prescribed



Source: National Ambulatory Medical Care Survey (Linder and Stafford 2001).

Effectiveness: Getting Better When Sick

Antibiotic Treatment for Pneumonia

Why is this important? About 600,000 Medicare beneficiaries are hospitalized with pneumonia each year (CMS 2000). Research has found a 15 percent reduced death rate (30-day mortality) when Medicare patients are given antibiotics within eight hours after hospitalization for pneumonia (Meehan et al. 1997). The American Thoracic Society and infectious disease experts recommend that a blood culture be drawn before antibiotics are administered so that treatment can be tailored to the specific form of infection whenever possible (Niederman et al. 2001; Bartlett et al. 2000).

Findings: In half the states, more than 14 percent of Medicare patients hospitalized with pneumonia did not receive timely and appropriate antibiotic treatment during 1998–1999. Rates of timely antibiotic administration ranged from a low of 76 percent in Florida to a high of 93 percent in Montana. Source: Medicare claims and hospital records (Jencks et al. 2000).

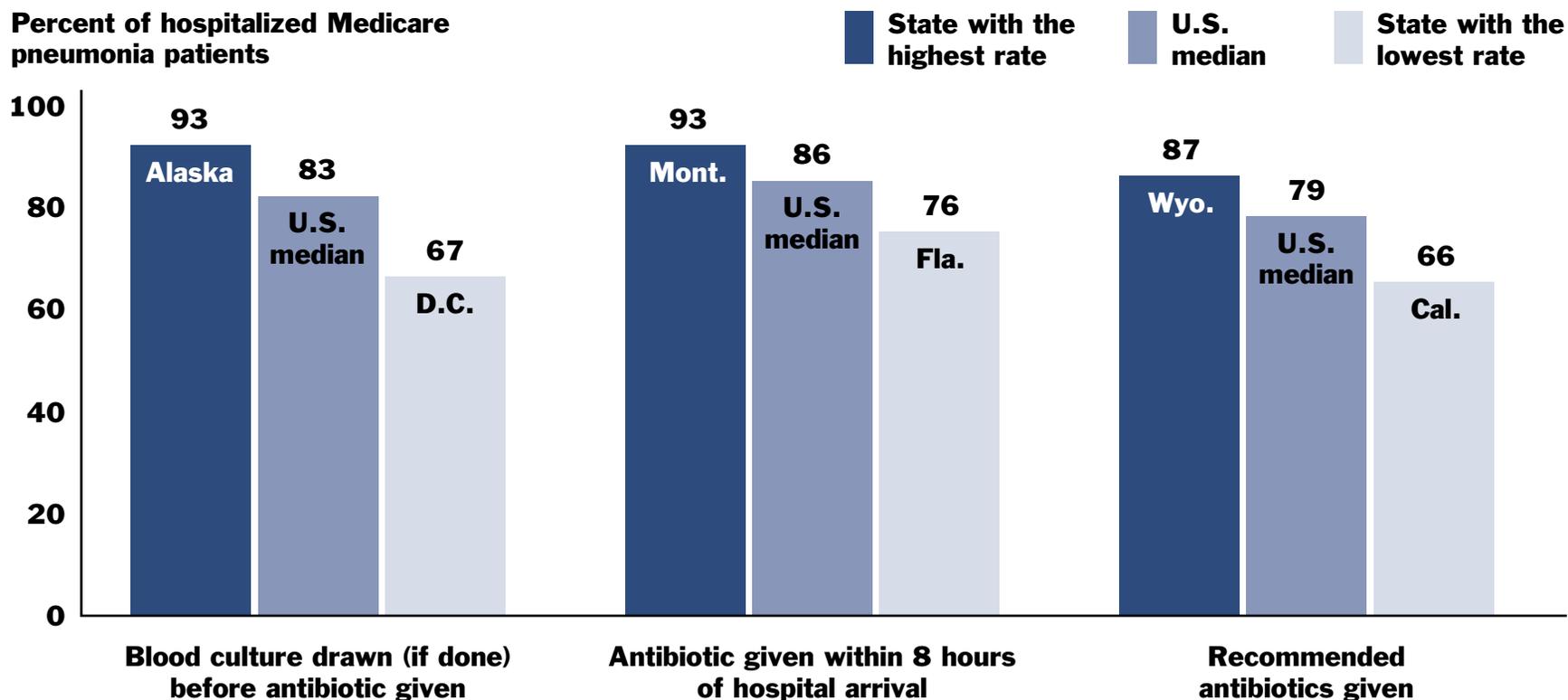
Implications: Additional improvement in treatment of pneumonia could avert many premature deaths. Collaborative quality improvement programs at the hospital and state level show that pneumonia treatment practices can change when clinical guidelines are supported with evidence linking process-of-care to better outcomes (Meehan et al 2001). Many hospitalizations for pneumonia could be prevented altogether if more older adults were immunized with pneumococcal vaccine as recommended (see Chart 1–2).



Chart 1-7

Antibiotic Treatment for Pneumonia

In half the states, more than 14 percent of Medicare beneficiaries hospitalized with pneumonia did not receive timely and appropriate antibiotic care during 1998–1999.



Source: Medicare claims and hospital records (Jencks et al. 2000). U.S. data include the 50 states plus the District of Columbia (D.C.).

Effectiveness: Getting Better When Sick and Living with Chronic Illness

Appropriateness of Procedures

Why is this important? Appropriateness means that, “for individuals with particular clinical and personal characteristics, the expected health benefit from doing a . . . procedure exceeds the expected health risk by a sufficient margin so that the intervention is worth doing.” Researchers at RAND and the University of California–Los Angeles developed a method to measure this concept by (1) convening a panel of experts to review the evidence and rate the appropriateness of reasons for doing a medical procedure, and (2) using information from the medical records of patients who had a procedure to determine the reason it was done and assign an appropriateness score based on the panel’s ratings (McGlynn and Brook 2001).

Findings: In studies measuring the appropriateness of several medical procedures performed over the past two decades, 2 percent to 17 percent of the procedures were performed for inappropriate reasons and 9 percent to 38 percent were done for questionable clinical reasons. Overall, about one-third of the procedures were considered inappropriate or had questionable benefit. Sources: Bernstein et al. 1993; Tobacman et al. 1996; Winslow et al. 1988; Hilborne et al. 1993; Chassin et al. 1987.

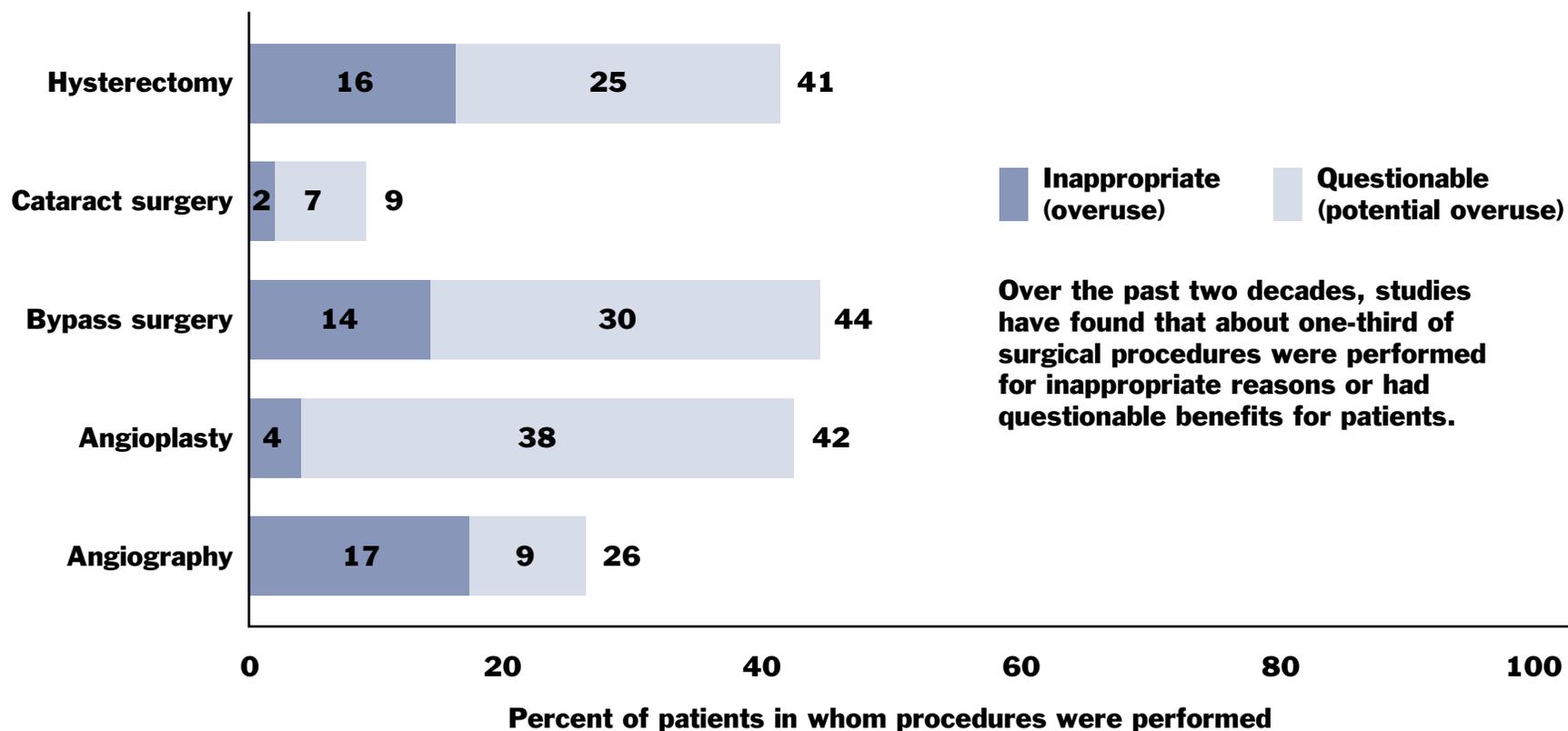
Hysterectomy is the removal of the uterus. *Cataract surgery* is done to remove a clouded lens from the eye and (typically) implant an artificial lens. *Bypass surgery* and *angioplasty* are done to restore blood flow when the arteries that supply blood to the heart muscle have become clogged. *Angiography* is a diagnostic test to determine the location and extent of such blockage and the need for bypass surgery or angioplasty.

Implications: The quality of health care—as measured by the appropriateness of procedures—is variable. Other research has found that some of these same procedures are underused when they would have been beneficial to patients who did not receive them (Hemingway et al. 2001). Overuse of procedures exposes patients to unnecessary risk of complications and wastes resources that could be put to better use where effective treatment is underused.



Chart 1-8

Appropriateness of Procedures as Rated by Expert Consensus



Source: Adapted from McGlynn and Brook 2001. Copyright © 2001 by Jossey-Bass Inc. This material is used by permission of John Wiley & Sons, Inc. Studies by Bernstein et al. 1993; Tobacman et al. 1996; Winslow et al. 1988; Hilborne et al. 1993; Chassin et al. 1987.

Effectiveness: Living with Chronic Illness

Diabetes Management

Why is this important? Diabetes, the seventh leading cause of death in the U.S., increased 33 percent in prevalence during the 1990s and now affects 16 million Americans. Strong research shows that the development and progression of diabetes complications can be reduced through blood sugar control. Complications of diabetes include blindness, kidney failure, and cardiovascular disease resulting in heart attacks, strokes, and amputations. Treatment for these complications costs nearly \$100 billion annually (Mokdad et al. 2000; ADA 2001).

Findings: Many people with diabetes do not receive recommended care from their practitioners nor perform recommended self-care. A survey of people with diabetes conducted in 40 states during 1997–1999 found that:

- Two in five did not have an annual dilated eye examination to check for signs of retinopathy, an eye disease that can lead to blindness.
- Almost half did not get a foot examination to check for nerve damage.
- Three-quarters did not report having at least one glycosylated hemoglobin test in the past year (this test gives a three-month average reading of blood sugar control so that the doctor can adjust medications and recommend diet and exercise changes).
- Over half did not monitor their own blood sugar to help in adjusting their diet and medications.

Source: Behavioral Risk Factor Surveillance System (CDC 2000c).

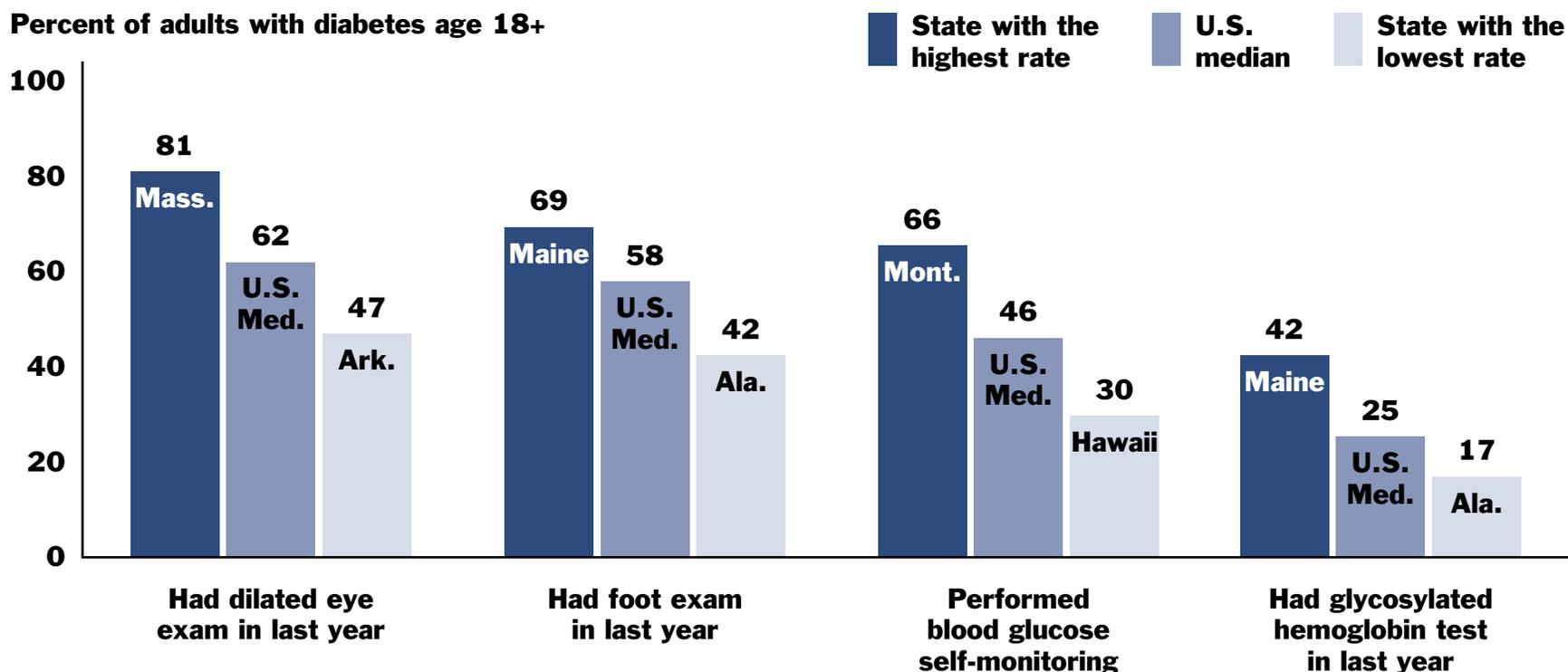
Implications: Diabetes care can be improved. Achieving the standards of care recommended by the American Diabetes Association and other experts will require multi-disciplinary effort among health care professionals, health plans, public health officials, and patients (see Chart 6–3).



Chart 1-9

Diabetes Management

Up to three-quarters of adults with diabetes did not receive recommended care from their health care practitioner in the middle-range state during 1997–1999, and over one-half did not perform recommended self-care.



Source: Behavioral Risk Factor Surveillance System (CDC 2000c). U.S. data includes 39 states and the District of Columbia. Data were not available for the following states: Delaware, Illinois, Indiana, Maryland, Missouri, New York, Oklahoma, Oregon, South Carolina, South Dakota, Washington.

Effectiveness: Living with Chronic Illness

Asthma Management

Why is this important? Asthma has more than doubled in prevalence since 1980, especially among children, and now affects 15 million Americans. Asthma results in 500,000 hospitalizations and 5,000 deaths each year in the U.S., many of which could be avoided if persons with asthma and their health care providers managed asthma according to established guidelines (DHHS 2000).

Treatment for asthma depends on severity of disease and includes patient education, control of environmental factors, ongoing monitoring, and drug therapy as appropriate. People with persistent asthma who take preventive medication (such as inhaled corticosteroids) for long-term control of underlying inflammation—rather than relying on short-acting bronchodilators for relief—have fewer flare-ups and emergency visits to the hospital (Adams 2001).

Findings: Over one-third of people with persistent asthma enrolled in managed health care plans in 2000 were not using recommended medications for long-term asthma control. Source: Health Plan Employer Data and Information Set (NCQA 2001a).

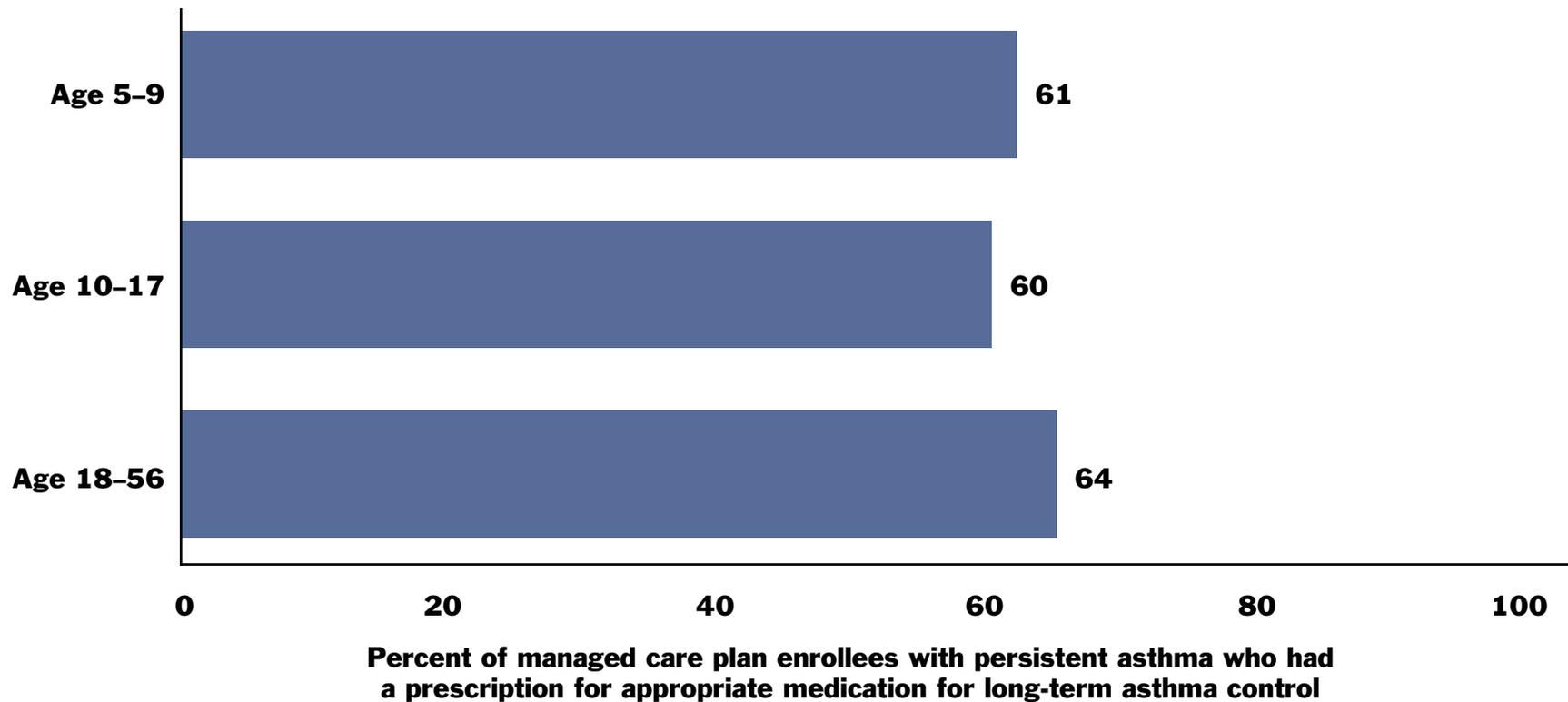
Implications: Managed health care plans appear to have achieved a substantial improvement in asthma care, considering that only one-quarter of children in the general population were using asthma controller medications earlier in the decade (Halterman et al. 2000). Yet, many more people with persistent asthma could benefit from appropriate asthma medication. Improvement in asthma management requires a partnership between patients and health care professionals. Asthma education programs have been shown effective in improving asthma self-management and reducing emergency department visits and hospitalizations (Gibson et al. 2001).



Chart 1-10

Asthma Management

Over one-third of children and adults with persistent asthma and enrolled in managed health care plans did not receive appropriate medications for long-term asthma control in 2000.



Source: Health Plan Employer Data and Information Set (NCQA 2001a). Adapted with permission from the National Committee for Quality Assurance.

Effectiveness: Living with Chronic Illness

Stroke Prevention for Patients with Atrial Fibrillation

Why is this important? Atrial fibrillation—a rapid and irregular heart beat—afflicts about two million Americans. It often leads to the formation of blood clots that may travel to the brain, resulting in about 90,000 strokes each year (American Heart Association 2001). Research shows that the blood-thinning drug warfarin can prevent many of these strokes. As a result, the American College of Chest Physicians and other experts recommend warfarin for people with atrial fibrillation who are at the greatest risk of stroke, such as those age 65 and over who do not have contraindications (Gorelick et al. 1999; Kerr et al. 2000).

Findings: In half the states during 1998–1999, 45 percent (or more) of Medicare patients hospitalized with atrial fibrillation (who did not have contraindications to warfarin) were discharged from the hospital without a prescription or plan for warfarin use after hospitalization. Rates of planned warfarin use ranged from a low of 42 percent in Nevada to a high of 65 percent in North Dakota. Source: Medicare claims and hospital records (Jencks et al. 2000).

Implications: Stroke prevention medications are underprescribed for patients with atrial fibrillation. Since warfarin requires frequent monitoring due to a small risk of abnormal bleeding, it is not realistic to expect its universal use even among eligible patients. Yet some experts believe that “both patients and physicians might be overly concerned about the risks involved with this very important therapy” (MGH 1998). Establishing anti-coagulation specialty centers and monitoring programs around the country could help ensure that patients are not denied the benefits of warfarin therapy due to barriers in medical management. Wider use of warfarin could prevent an estimated 10,000 stroke deaths each year (MGH 1998).

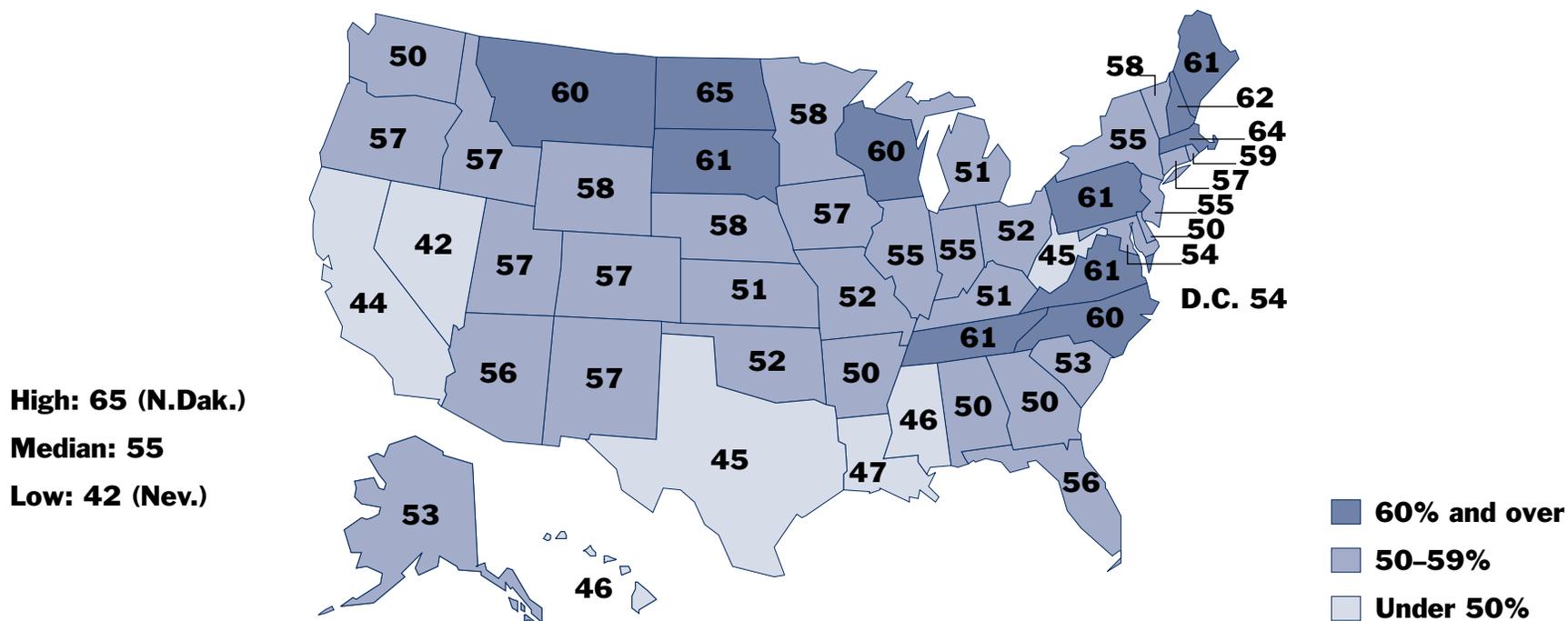


Chart 1-11

Stroke Prevention for Patients with Atrial Fibrillation

In half the states during 1997–1999, 45 percent (or more) of hospitalized Medicare patients with irregular heart beat did not receive blood thinning drugs to reduce their risk of having a stroke.

Percent of Medicare patients with atrial fibrillation with a prescription or plan for warfarin at hospital discharge*



Source: Medicare claims and hospital records (Jencks et al. 2000). *Excludes patients with contraindications to warfarin. U.S. data includes the 50 states plus the District of Columbia (D.C.).

Effectiveness: Living with Chronic Illness

Treatment and Outcomes for HIV

Why is this important? About 900,000 Americans are infected with human immunodeficiency virus (HIV), which has become a leading cause of death among young men and an increasing cause of death among young women. Recent advances in treatment for HIV have made the disease a manageable, chronic illness. While treatment is complex to provide, it can prevent complications such as pneumonia, slow the progression to AIDS, and prolong life (CDC 2001d; Asch et al. 2000).

Patients with HIV need regular care from a health professional who can monitor their status and adjust treatment to include the most up-to-date therapies. Those who are receiving good quality outpatient care should be able to avoid most emergency room (ER) visits and hospitalizations, though some hospital use may be unavoidable as the disease progresses (Shapiro et al. 1999).

Findings: From 1996 to 1998, the proportion of adult patients who had satisfactory HIV care and outcomes increased from 29 percent to 47 percent of patients. There was a 44 percent improvement in the provision of highly active antiretroviral therapy (HAART), but only modest improvement in treatment to prevent lung infections. Adverse outcomes declined: one-third fewer HIV patients visited the hospital emergency room, and one-quarter fewer were hospitalized. Still, over half of HIV patients did not have satisfactory care and outcomes in 1998. Source: HIV Cost and Services Utilization Study (Shapiro et al. 1999).

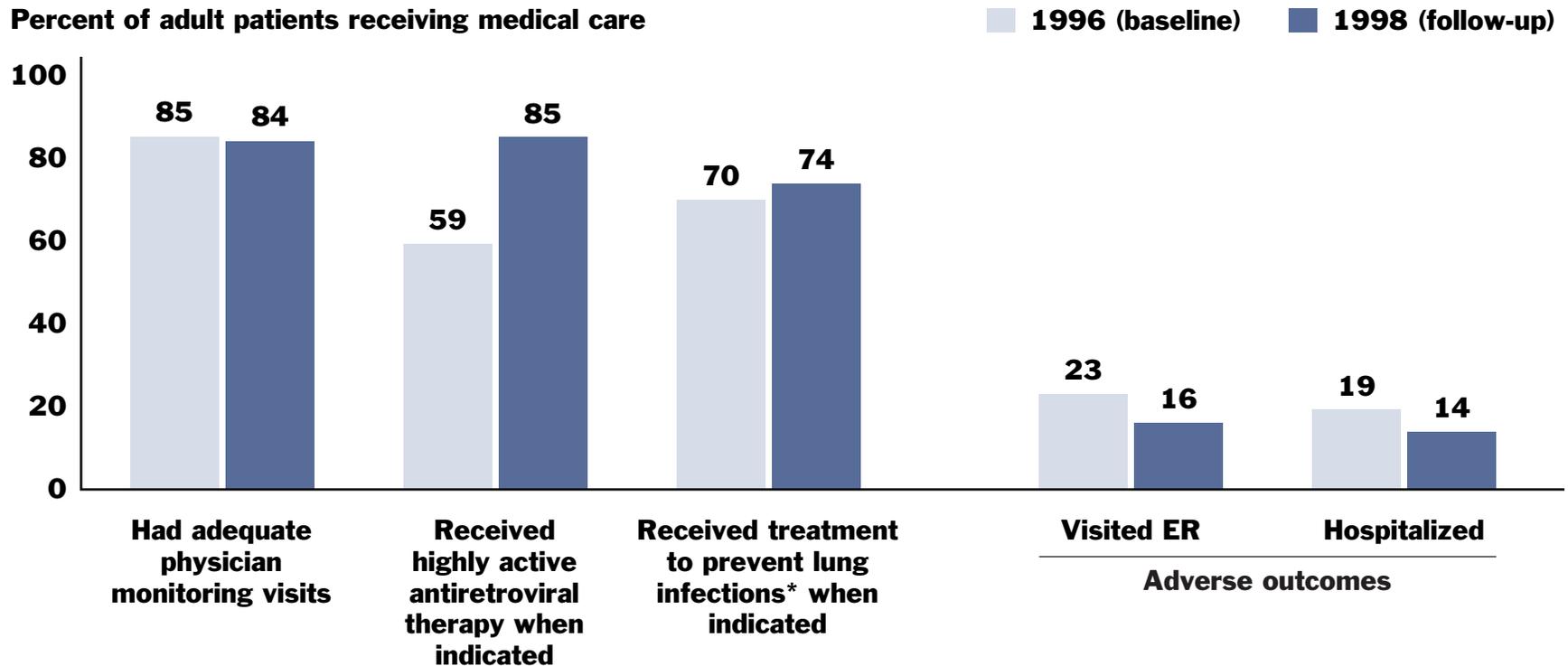
Implications: Treatment of HIV is improving overall, but substantial further improvement is needed to provide optimal care for all patients. Prevention, diagnosis, and treatment can have a major impact on the HIV/AIDS epidemic (CDC 2001d).



Chart 1-12

Treatment and Outcomes for HIV

There was a 44 percent increase in highly active antiretroviral therapy for adult patients with HIV from 1996 to 1998, with fewer adverse outcomes. Still, one-half of HIV patients did not have satisfactory care and outcomes.



Source: HIV Cost and Services Utilization Study (Shapiro et al. 1999). All measures reflected treatment or outcomes in the previous six months, except antiretroviral therapy was anytime prior to a specified date (December 1986 or January 1998). *Prophylaxis against *Pneumocystis carinii* pneumonia. See Technical Appendix.

Effectiveness: Living with Chronic Illness

Coronary Artery Disease: Medication to Prevent Recurrent Heart Attack

Why is this important? Coronary artery disease—caused by the narrowing and blockage of arteries that supply blood to the heart—is the number one cause of death among Americans and the leading cause of disability in the labor force. Over one million people suffer a heart attack each year; about 40 percent die of it (American Heart Association 2001).

Research has shown that certain medications significantly reduce the recurrence of heart attack and improve patients' survival when prescribed during hospitalization and afterwards as long-term preventive therapy. Treatment with beta-blockers helps the heart work better and “is one of the most scientifically substantiated, cost-effective preventive medical services,” improving long-term survival by up to 40 percent when used after a heart attack (Soumerai et al. 1997; Ryan et al. 1999).

Findings: In half the states during 1998–1999, over one-quarter of Medicare heart attack patients who were ideal candidates for beta-blockers did not get a prescription for a beta-blocker when they were discharged from the hospital. Rates of beta-blocker prescriptions ranged from a low of 47 percent in Mississippi to a high of 93 percent in the District of Columbia and Massachusetts. Source: Medicare claims and hospital records (Jencks et al. 2000).

Implications: Evidence-based improvement in treatment of heart attack during the 15 years, though gradual, has contributed to an overall decline in the death rate due to coronary artery disease (McGovern et al. 2001). Up to 18,000 more deaths from heart attack could be prevented each year if all patients who were eligible received beta-blockers, based on one estimate (Chassin 1997).

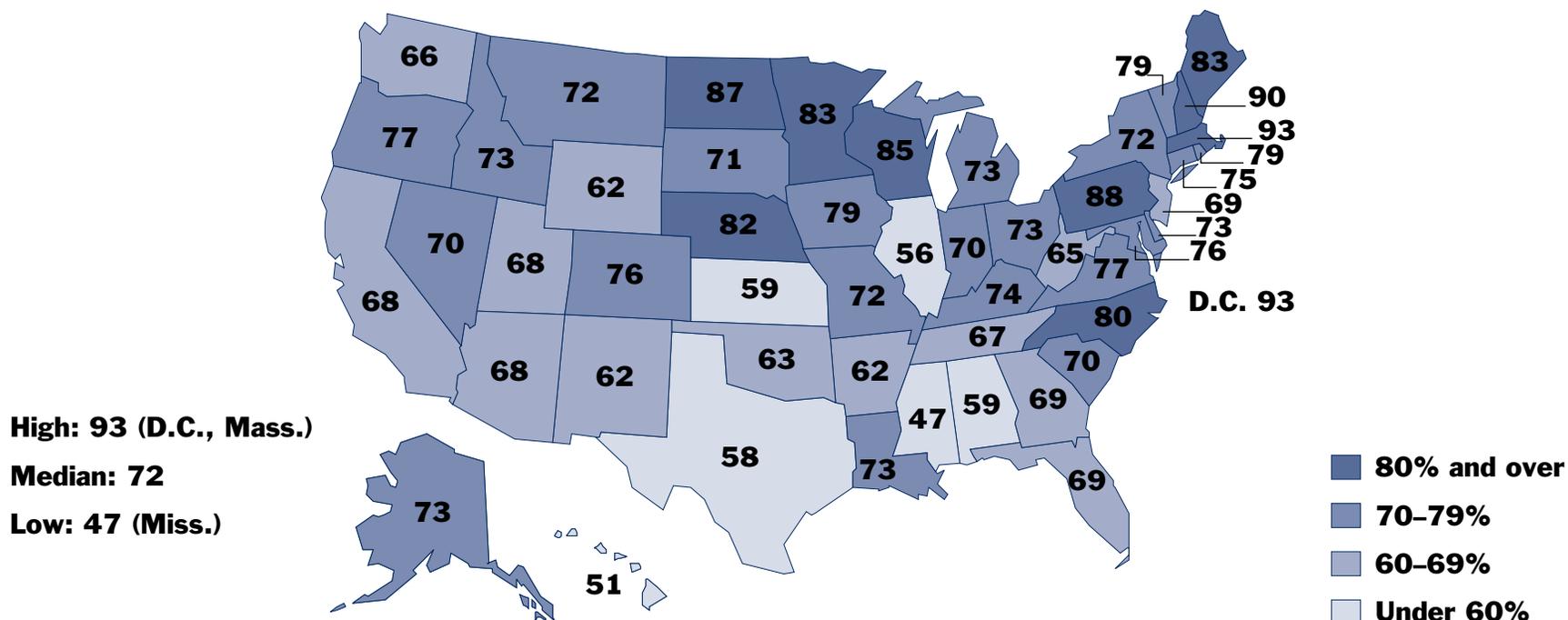


Chart 1-13

Medication to Prevent Recurrent Heart Attack

In half the states during 1998–1999, over one-quarter of Medicare heart attack patients who were ideal candidates for medication to prevent recurrent heart attacks did not receive it.

Percent of Medicare heart attack patients prescribed a beta-blocker at hospital discharge when indicated*



Sources: Medicare claims and hospital records (Jencks et al. 2000). *Ideal candidates are those without contraindications, for whom treatment would almost always be indicated based on clinical guidelines. U.S. data includes the 50 states plus the District of Columbia (D.C.).

Effectiveness and Timeliness: Living with Chronic Illness

Coronary Artery Disease: Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack

Why is this important? Thrombolytic therapy dissolves blood clots blocking the flow of blood and oxygen to the heart muscle. If started promptly when indicated after a heart attack, thrombolytic therapy significantly improves patient survival. The sooner thrombolytic therapy is started, the greater the benefit it confers—35 lives saved per 1,000 patients treated in the first hour after symptoms occur, as compared to 16 lives saved per 1,000 treated after seven to 12 hours have elapsed (the benefits may be less for older patients). Therefore, the National Heart Attack Alert Program advocates a national goal of starting thrombolytic therapy within 30 minutes of a patient's arrival at the hospital (Ryan et al. 1996).

Findings: During the 1990s, selected hospitals participating in an industry-sponsored national registry reduced the median time to start thrombolytic therapy by 40 percent, from 62 minutes to 38 minutes after a patient's arrival at these hospitals. Nevertheless, 24 percent of heart attack patients who could have benefited from thrombolytic therapy—including those at the highest risk of death—failed to receive it. Source: National Registry of Myocardial Infarction (Barron et al. 1998; Rogers et al. 2000). Results may not be representative of all hospitals.

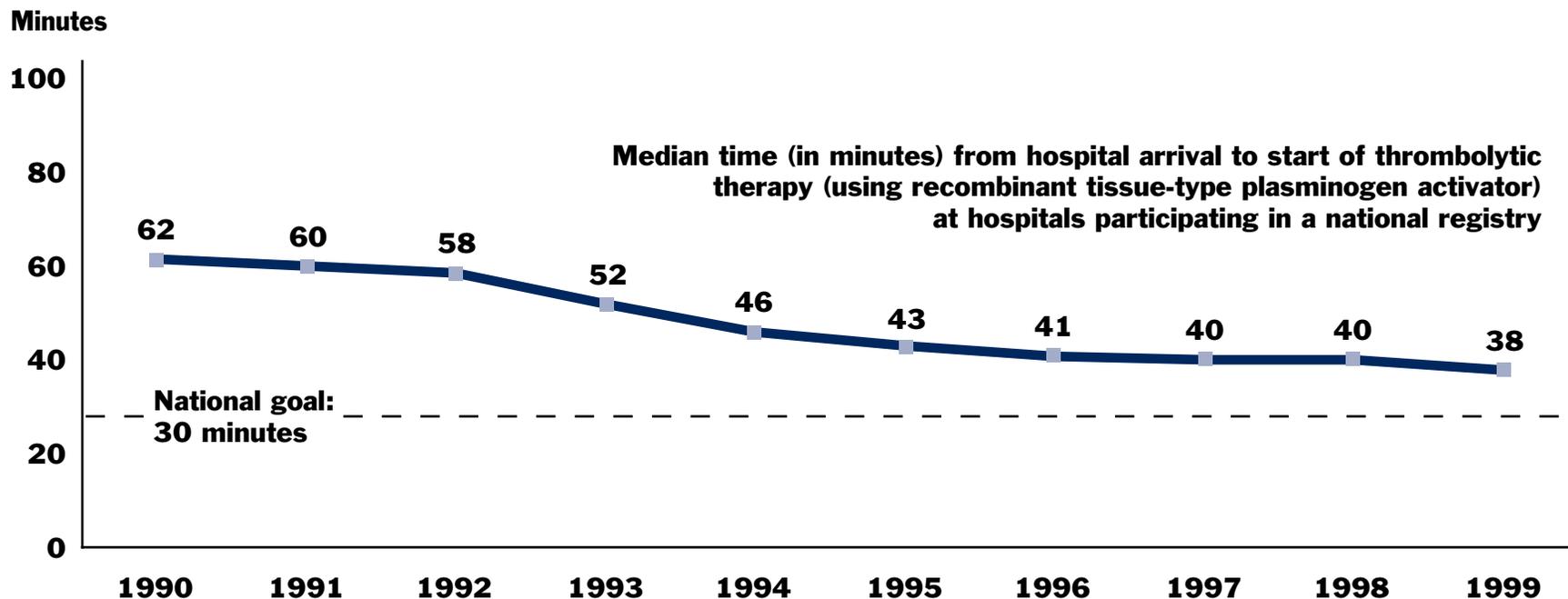
Implications: The timely use of thrombolytic therapy has contributed to the overall decline in heart attack death rates over the past decade (McGovern et al. 2001). Hesitancy to prescribe thrombolytic therapy may arise from concern about side-effects or uncertainty about eligibility criteria (Ryan et al. 1999). Up to 4,000 additional deaths from heart attack could be averted each year if all patients who were eligible for thrombolytic therapy received it on a timely basis along with other recommended treatment (Fendrick, Ricker, and Bloom 1994).



Chart 1-14

Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack

Some hospitals reduced the time to start treatment with clot-dissolving drugs that restore blood flow to the heart muscle by nearly 40 percent, but further improvement is needed to reach the national goal of 30 minutes.



Source: National Registry of Myocardial Infarction (Rogers et al. 2000). Adapted and reprinted with permission from the American College of Cardiology. Results may not be representative of all hospitals.

Effectiveness: Living with Chronic Illness

Mental Health Care: Treatment for Depression

Why is this important? Between 5 percent and 10 percent of the U.S. population suffers from depression in a given year. Depression is the leading cause of suicide and disability, with a social cost of \$44 billion including treatment and lost productivity. Many adults with depression do not receive any treatment, even though appropriate treatment with antidepressant medication or certain time-limited psychotherapies is effective and has been recommended by evidence-based national guidelines (Wells et al. 1996; AHRQ 1993; 1999).

Findings: Antidepressant medication was received in an appropriate dose by 35 percent of patients with major and/or chronic depression who were seeing primary care physicians affiliated with seven managed care plans during 1996–1997. In comparison, 24 percent of patients with major depression received any dose of an antidepressant from a primary care physician or mental health specialist in a 1986 study in three cities (only about 60 percent of these patients received an appropriate dose). Sources: Medical Outcomes Study (Wells et al. 1994); Partners in Care Study (Wells et al. 1999). Comparable data on psychotherapy is not available.

Implications: These data suggest an improvement in antidepressant treatment for depression among patients who use the health care system, though rates of treatment remain low. For example, only about half the patients with depression received any mental health care, including medication, counseling, or a referral for counseling, from their primary care provider in the 1996–1997 study (Wells et al. 1999). Additional data on psychotherapy is needed to form a more complete picture, since many people who desire treatment for depression say they would prefer counseling rather than medication (Dwight-Johnson et al. 2000).

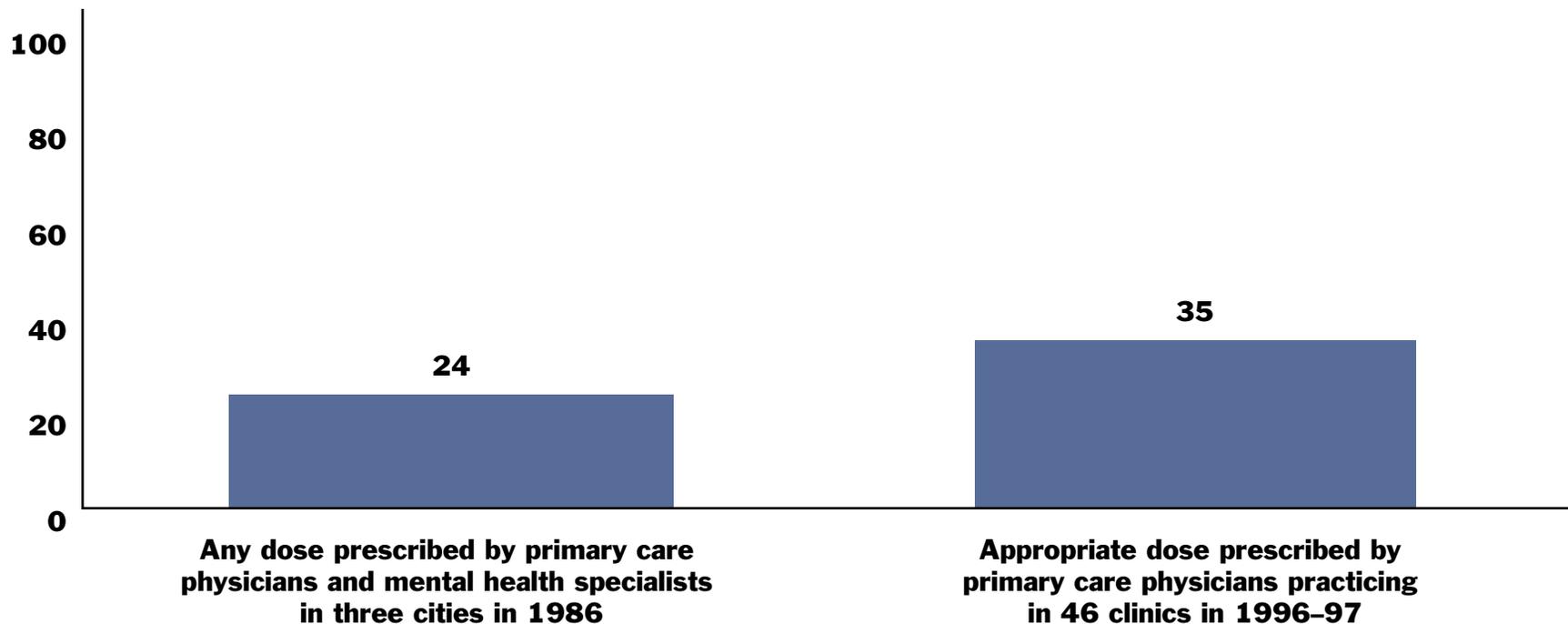


Chart 1-15

Mental Health Care: Treatment for Depression

More patients with depression received antidepressant medication in a 1996–1997 study than in a similar 1986 study, but a significant proportion of people did not receive effective treatment.

Percent of adult patients with major or chronic depression who received antidepressants



Sources: Medical Outcomes Study (Wells et al. 1994); Partners in Care Study (Wells et al. 1999). Data for 1986 includes only those with major depression. Data not available on patients treated with psychotherapies.

Effectiveness: Long-Term Care

Nursing Home Care and Outcomes

Why is this important? The quality of nursing home care has been a matter of national concern since a 1986 Institute of Medicine report exposed significant quality problems, leading to increased federal regulation and oversight (IOM 1986). Two quality indicators of interest to the elderly and their families are:

Physical restraints. There is little evidence that restraints actually improve safety or help manage agitation and they may have many side-effects including pressure ulcers, social isolation, and even death. Federal law states that nursing home residents have a right to be free from restraints that are not required to treat the resident's medical symptoms (Johnson and Kramer 2000; CMS 2001a).

Pressure ulcers (bed sores). These occur when areas of the skin and underlying tissues become injured and erode due to pressure, friction, and/or lack of blood supply. Pressure ulcers are generally preventable with good skin care, changes in position, proper nutrition, and pressure relieving devices. Left untreated, they may result in pain, infection, longer nursing home stays, and death. When pressure ulcers do occur or when residents are admitted with them, they can be treated to avoid becoming more serious and to cure them when possible (Johnson and Kramer 2000; CMS 2001a).

Findings: The use of physical restraints by nursing homes declined by 52 percent from 1993 to 2000. The prevalence of pressure ulcers changed only slightly during this time period. Source: On-line Survey, Certification and Reporting (OSCAR) system (Harrington, Carrillo, and Wellin 2001).

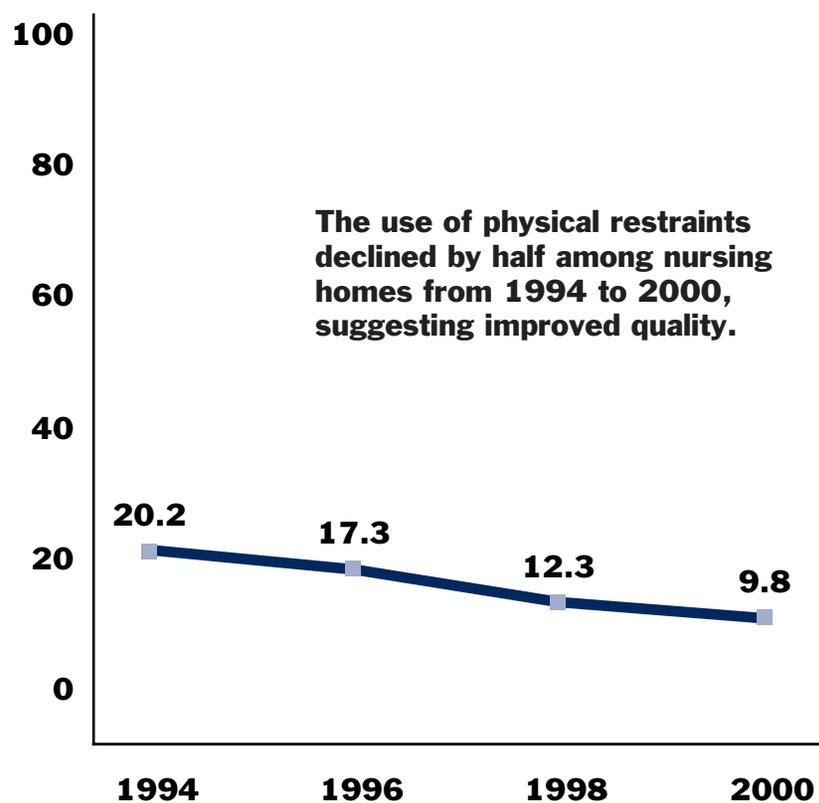
Implications: These two measures, while providing only a limited view, suggest that nursing home care has improved in some respects but still requires significant improvement in other respects.



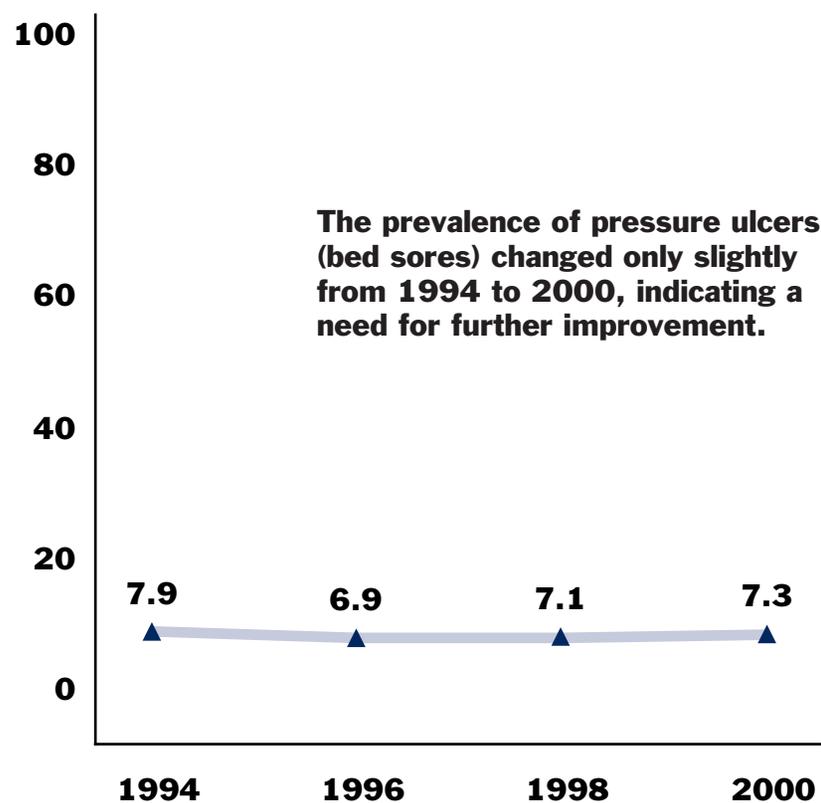
Chart 1-16

Nursing Home Care and Outcomes

Percent of nursing home facilities that used physical restraints



Percent of nursing home residents with pressure ulcers



Source: On-line Survey, Certification, and Reporting (OSCAR) system (Harrington, Carrillo, and Wellin 2001).

Chapter 2

Patient Safety

Some degree of error is inherent in all human activity. . . . In highly technical, complicated systems, even minor errors may have disastrous consequences.

—Lucian Leape and colleagues, 1991

Chapter 2

Patient Safety: Introduction

The Institute of Medicine's 1999 report, *To Err Is Human*, shocked the nation with estimates that mistakes and system failures in medicine result in 44,000 to 98,000 deaths in hospitals each year, ranking medical mistakes with the leading causes of death in the U.S. (IOM 2000; Chart 2–1).

Although the number of deaths due to medical mistakes remains a matter for debate, few dispute that medical mistakes are a serious problem and that their reduction must be a national priority.

Medical mistakes may well be the most easily understood area of health care quality. Newspaper stories offer tragic examples, such as:

- a patient who dies due to a drug mix-up in the hospital,
- a missed or delayed diagnosis for cancer, and
- surgery done on the wrong side of a patient's body.

While compelling, these stories do not provide the full scope of the problem. The charts in this section describe medical mistakes globally in terms of frequency, types, and outcomes.

The good news is that many medical mistakes are preventable. Other industries have learned to design systems so that they achieve “zero defects.” This knowledge as well as experience from within the health care community provides practical roadmaps for making the health care system safer. Proven strategies include better training and team communication as well as standardization of equipment and processes.

- The federal government is redesigning its error reporting databases and several states have enacted new reporting laws so that health care providers can learn from one another and prevent the repetition of similar kinds of mistakes (Adams 2001).
- Some surgeons and hospitals are participating in a program to prominently mark the surgical site in advance of an operation to prevent wrong-site surgery (JCAHO 2001).

Much more remains to be done at all levels to build safety into the health care system so that it holds true to the value of patient well-being encapsulated in the Hippocratic dictum: “First, do no harm.”

Patient Safety: Summary of Charts and Findings

Chart 2–1: Estimated Deaths Associated with Medical Mistakes—Estimated deaths associated with medical mistakes rank among the leading causes of death in the U.S., exceeding deaths from motor vehicle accidents, breast cancer, or AIDS.

Chart 2–2 and 2–3: Preventable Adverse Events, Causes, and Outcomes—Medical mistakes resulting in patient disability or prolonged hospital stay occurred in about 2 percent of the hospitalizations in New York (in a seminal 1984 study) and in Utah and Colorado (in a similar 1992 study), accounting for over half of all adverse events in hospitals in those states. Mistakes most commonly occurred during surgery or other procedures. Seven percent resulted in patient death in Colorado and Utah, and another 7 percent resulted in a permanent disability.

Chart 2–4: Preventable Adverse Drug Events—In a study at two large Boston teaching hospitals, patient injuries resulting from medication mistakes occurred at a frequency of almost two per 100 hospital admissions in 1992. Over half of the medication mistakes occurred when drugs were prescribed by physicians, and another third occurred when drugs were administered to patients. One-fifth of the injuries were considered life-threatening.

Chart 2–5: Trends and Types of Medication-Prescribing Mistakes—At one New York State teaching hospital, medication-prescribing mistakes with the potential for adverse outcomes more than doubled in proportion to medication orders, tripled in proportion to patient-days, and quadrupled in proportion to hospital admissions over a nine-year period from 1987 to 1995. The majority of such mistakes involved incorrect dosing (overdosing or underdosing).

Chart 2–6: Potentially Inappropriate Prescribing for the Elderly—Medications that could cause harm in or have questionable effectiveness for the elderly were prescribed for 14 percent to 24 percent of elderly patients over the past decade.

Patient Safety

Preventable Adverse Events, Causes, and Outcomes

Why is this important? Medical mistakes or system failures that result in patient disability or prolonged hospital stay are known as preventable adverse events because they could be avoided with proper medical management or prevention programs. Preventable adverse events (defined in this strict way) should be distinguished from medical mistakes that do not result in any patient injury, and from other adverse events that are not preventable given the current state of medical knowledge.

Findings: Preventable adverse events occurred in about 2 percent of hospitalizations in a seminal 1984 New York State study, and in Utah and Colorado in a similar 1992 study, accounting for over half of all adverse events in hospitals (see Charts 2–2 and 2–3). These two studies, though older, represent the most thorough examination of this phenomenon to date. Sources: Brennan et al. 1991; Thomas et al. 2000.

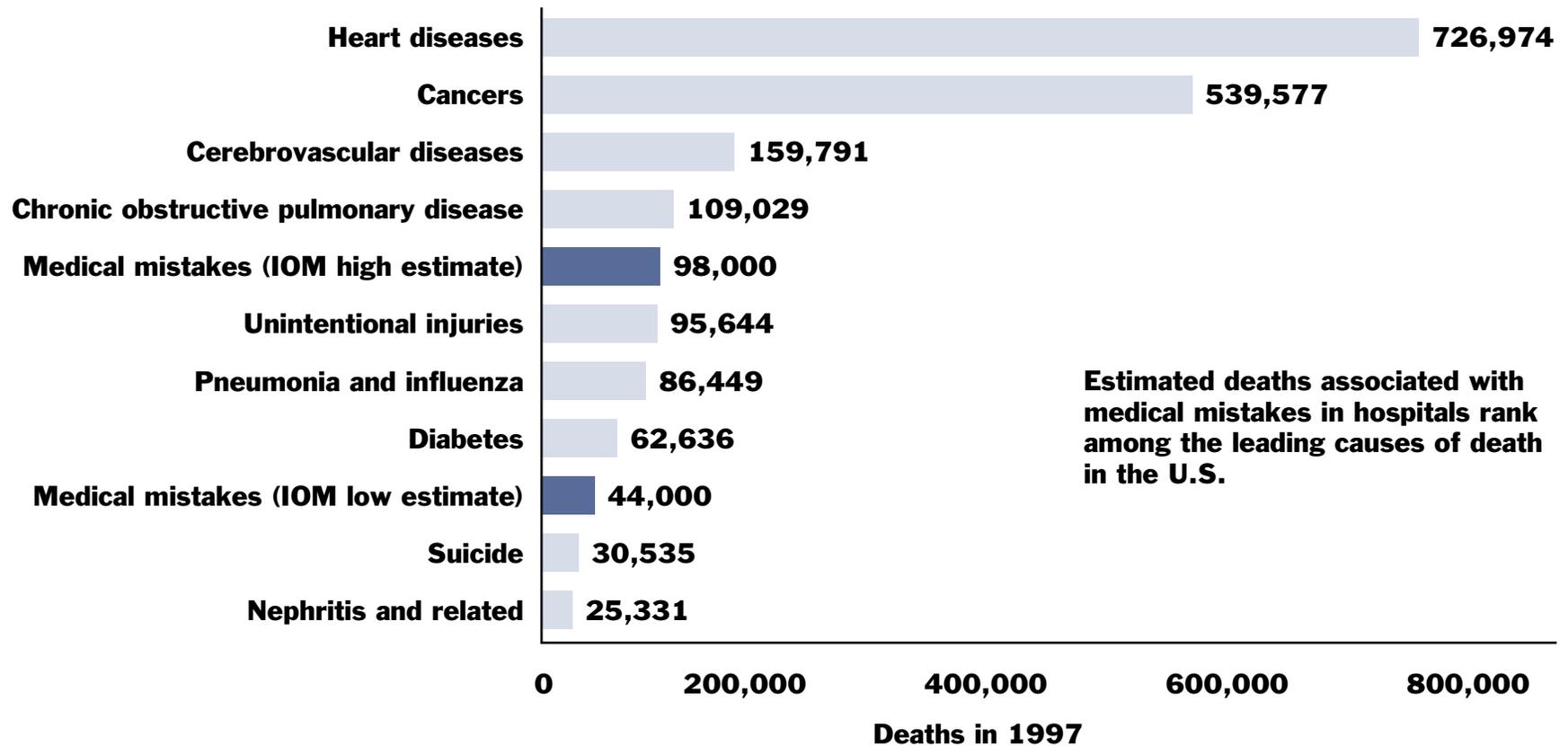
- The most commonly observed mistakes resulting in patient injury in New York involved the performance of surgical or other medical procedures (Leape et al. 1991; see Chart 2–2).
- Most preventable adverse events resulted in temporary injury, but 7 percent resulted in permanent disability and another 7 percent led to the death of the patient in Utah and Colorado (Thomas et al. 1999; Chart 2–3). Extrapolating this rate to the U.S. population as a whole suggests that up to 44,000 deaths in hospitals may be associated with medical mistakes annually (IOM 2000; see Chart 2–1).

Implications: Medical mistakes resulting in patient injury are relatively common in hospitals, with potentially devastating consequences for patients. Total costs of preventable adverse events—including health care, lost wages, and lost worker productivity—equaled 2 percent of health care expenditures in Utah and Colorado, or \$17 billion when extrapolated to the entire U.S. population (Thomas et al. 1999).



Chart 2-1

Estimated Deaths Associated with Medical Mistakes Compared to the Leading Causes of Death in the U.S.



Sources: IOM 2000; Kramarow et al. 1999 (deaths).

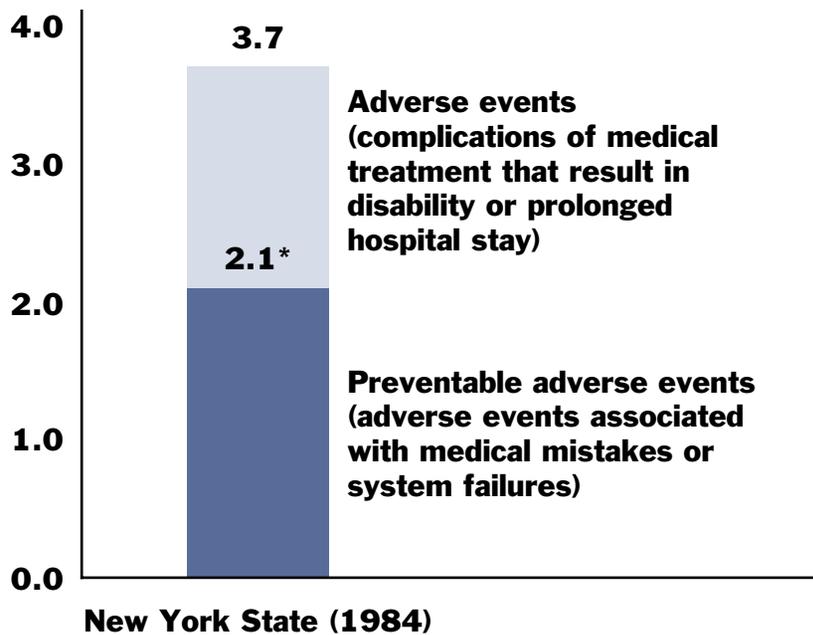


Chart 2-2

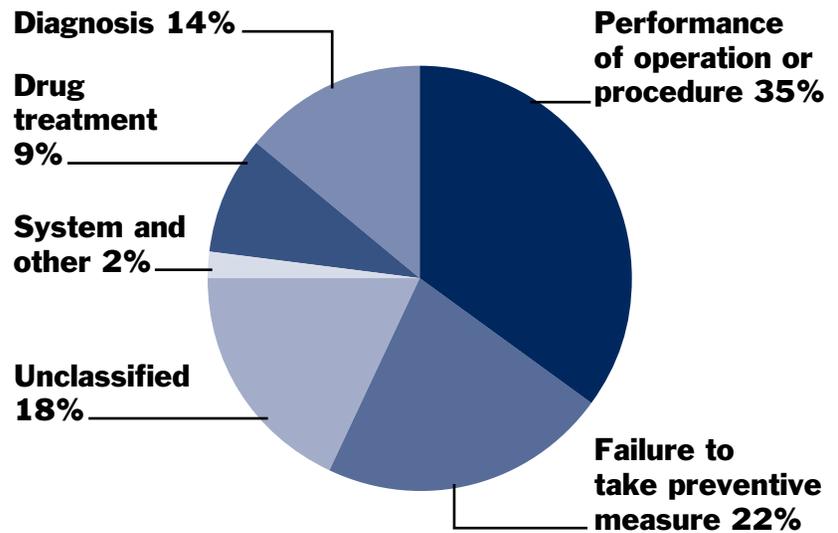
Preventable Adverse Events and Causes: New York

Medical mistakes resulting in patient disability or prolonged hospital stay (preventable adverse events) occurred in about 2 percent of the hospitalizations in New York State, accounting for over half of all adverse events in hospitals in 1984. Medical mistakes most commonly occurred during surgery or the performance of other procedures.

Frequency of adverse events and preventable adverse events (percent of hospitalizations)



Types of medical mistakes causing preventable adverse events (percent of observed mistakes)



Sources: Harvard Medical Practice Study (Brennan et al. 1991; Leape et al. 1991). *See Technical Appendix.

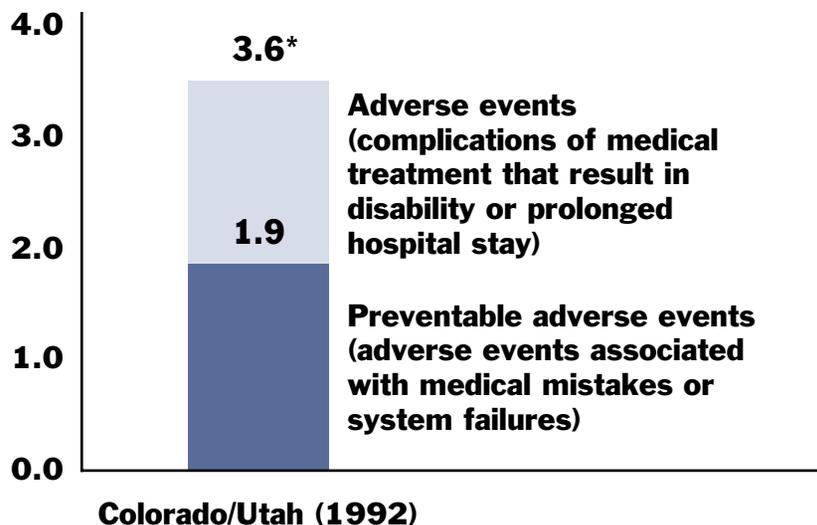


Chart 2-3

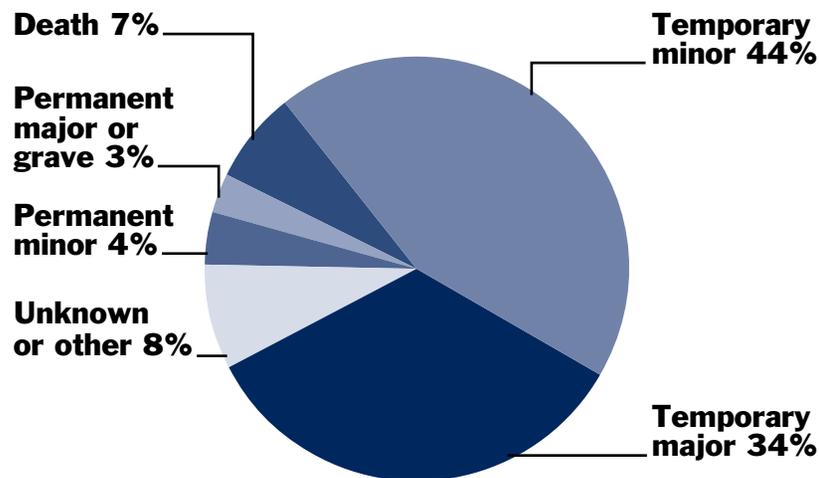
Preventable Adverse Events and Outcomes: Colorado/Utah

Medical mistakes resulting in patient disability or prolonged hospital stay (preventable adverse events) occurred in about 2 percent of the hospitalizations in Colorado and Utah in 1992, accounting for over half of all adverse events in hospitals in 1992. Seven percent resulted in permanent disability and another 7 percent in death.

Frequency of adverse events and preventable adverse events (percent of hospitalizations)



Outcomes of preventable adverse events: type of disability (percent of cases)



Sources: Thomas et al. 1999; Thomas et al. 2000. *See Technical Appendix.

Patient Safety

Preventable Adverse Drug Events

Why is this important? Preventable adverse drug events—which are defined as patient injury associated with a medication mistake—often receive less attention than adverse drug reactions, which are unintended side effects stemming from the appropriate use of drugs. While hospitals are required to report adverse drug reactions to the Food and Drug Administration, the reporting of preventable adverse drug events is often merely voluntary, with the result that only a small percentage are identified for learning purposes (Bates et al. 1995). Although the studies illustrated in these charts represent only the limited experience of two institutions, they are some of the best published data yet available on this problem.

Findings: Preventable adverse drug events occurred at a rate of almost two per 100 hospital admissions at two large Boston teaching hospitals in 1992 (Bates et al. 1995).

- Over half the preventable adverse events were associated with mistakes in drug prescribing (e.g., not selecting the correct drug and dosage) and another third with mistakes in administering drugs to patients (e.g., not giving the right drug to the right patient at the proper time intervals).
- One in five injuries associated with medication mistakes were considered life-threatening.

Implications: Preventing medication mistakes and resulting patient injuries is justified both from a patient safety and cost perspective. Patients who experienced a preventable adverse drug event had prolonged hospital stays and increased estimated total costs of \$4,685, equaling \$2.8 million on an annual basis for a large 700-bed hospital (Bates et al. 1997). Better reporting of medication-related injuries associated with medication mistakes would encourage efforts to prevent them.

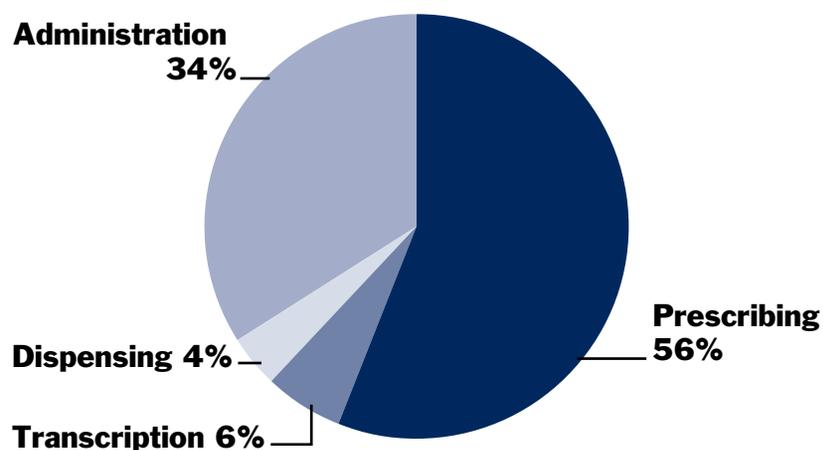


Chart 2-4

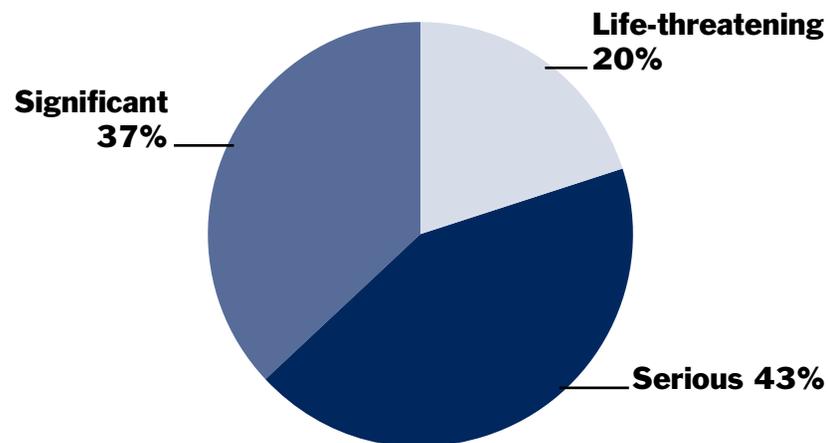
Preventable Adverse Drug Events

In a study at two large Boston teaching hospitals, patient injuries resulting from medication mistakes (known as preventable adverse drug events) occurred at a frequency of almost two per 100 hospital admissions in 1992. Over half of the medication mistakes occurred when drugs were prescribed by physicians, and another third of the mistakes occurred when drugs were administered to patients. One in five of resulting injuries were considered life-threatening.

Stage of medication process at which medication mistakes occurred



Severity of injuries resulting from medication mistakes



Source: Bates et al. 1995.

Patient Safety

Trends and Types of Medication–Prescribing Mistakes

Why is this important? Medication mistakes occur most frequently at the prescribing stage. Such mistakes may become more frequent as the number of available drugs multiplies and as patients take more drugs, requiring that physicians know about the appropriate use and potential interactions of more drugs. Very little data has been published on trends in medication–prescribing mistakes over time.

Findings: Rates of medication–prescribing mistakes with the potential for adverse outcomes more than doubled in proportion to medication orders (from 1.8 to 4.1 per 1,000), tripled in proportion to hospital admissions (from 2.4 to 8.4 per 100), and quadrupled in proportion to patient–days (from 2.5 to 11.3 per 1,000) at one teaching hospital over a nine–year period. This trend is most likely due to increased drug use (medication orders per admission increased 50 percent during this time), patients being sicker on average, and better detection by pharmacists. Source: Lesar, Lomaestro, and Pohl 1997; personal communication with Timothy Lesar 2002.

- The majority of medication–prescribing mistakes at this institution involved over- or underdosing.
- Similar mistakes were repeated with increasing frequency; in addition, new errors were discovered as new types of drugs therapies were introduced.
- All of these medication mistakes were detected and prevented through a rigorous program of pharmacist review of prescriptions at this institution.

Implications: Although these results represent the experience of only one institution, they suggest that the risk of adverse drug events may be rising along with the intensity of drug therapy, highlighting the need for systematic efforts to identify and prevent such mistakes.

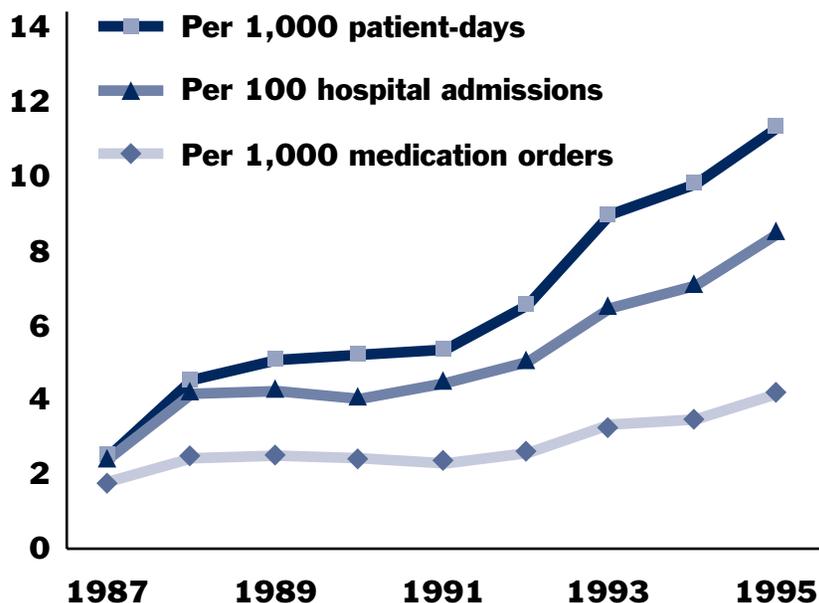


Chart 2-5

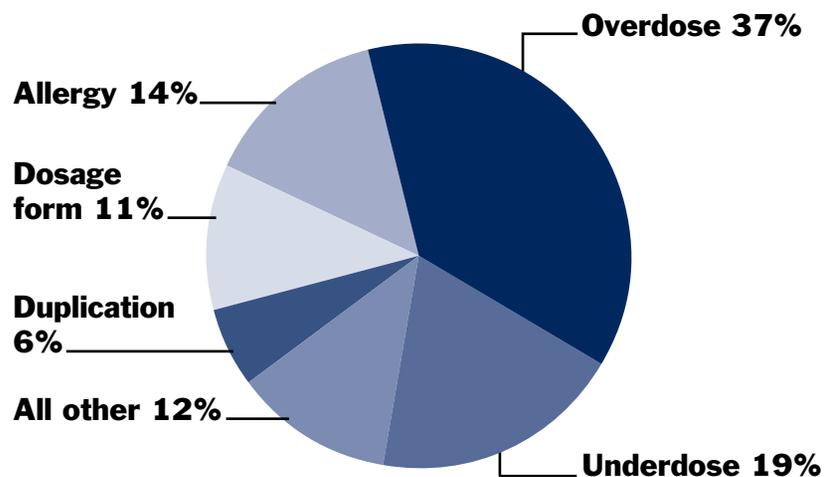
Trends and Types of Medication-Prescribing Mistakes

At one New York State teaching hospital, medication-prescribing mistakes with the potential for adverse outcomes more than doubled in proportion to medication orders, tripled in proportion to hospital admissions, and quadrupled in proportion to patient-days over a nine-year period. The majority of such mistakes involved incorrect dosing.

Time-trends in medication-prescribing mistakes (error rate)



Types of medication-prescribing mistakes*



Source: Adapted with permission from Lesar, Lomaestro, and Pohl 1997. Copyrighted 1997, American Medical Association. *Total does not add to 100 percent due to rounding.

Patient Safety

Potentially Inappropriate Prescribing for the Elderly

Why is this important? The prescription of medications that are inappropriate for the elderly is a major patient safety issue (GAO 1995). Inappropriate medications are those for which the risk outweighs the benefits; some medications create higher risks for elderly persons. Beers and his colleagues developed expert criteria for measuring potentially inappropriate drug prescribing among the elderly. The Beers criteria has been modified and used in several studies over the past decade (Aparasu and Mort 2000).

Findings: A review of six studies that were conducted during the past decade using similar criteria shows that 14 percent to 24 percent of elderly people were prescribed medications that could potentially cause harm in or have questionable effectiveness for the elderly. In a recent national study of noninstitutionalized elderly people living in the community, experts further delineated inappropriate medication use in 1996 as follows (Zhan et al. 2001):

- 2.6 percent had used one of 11 medications that should always be avoided in the elderly.
- 9.1 percent had used one of eight drugs that are appropriate only in rare circumstances.
- 13.3 percent had used one of 14 drugs that may sometimes be indicated but are often misused.

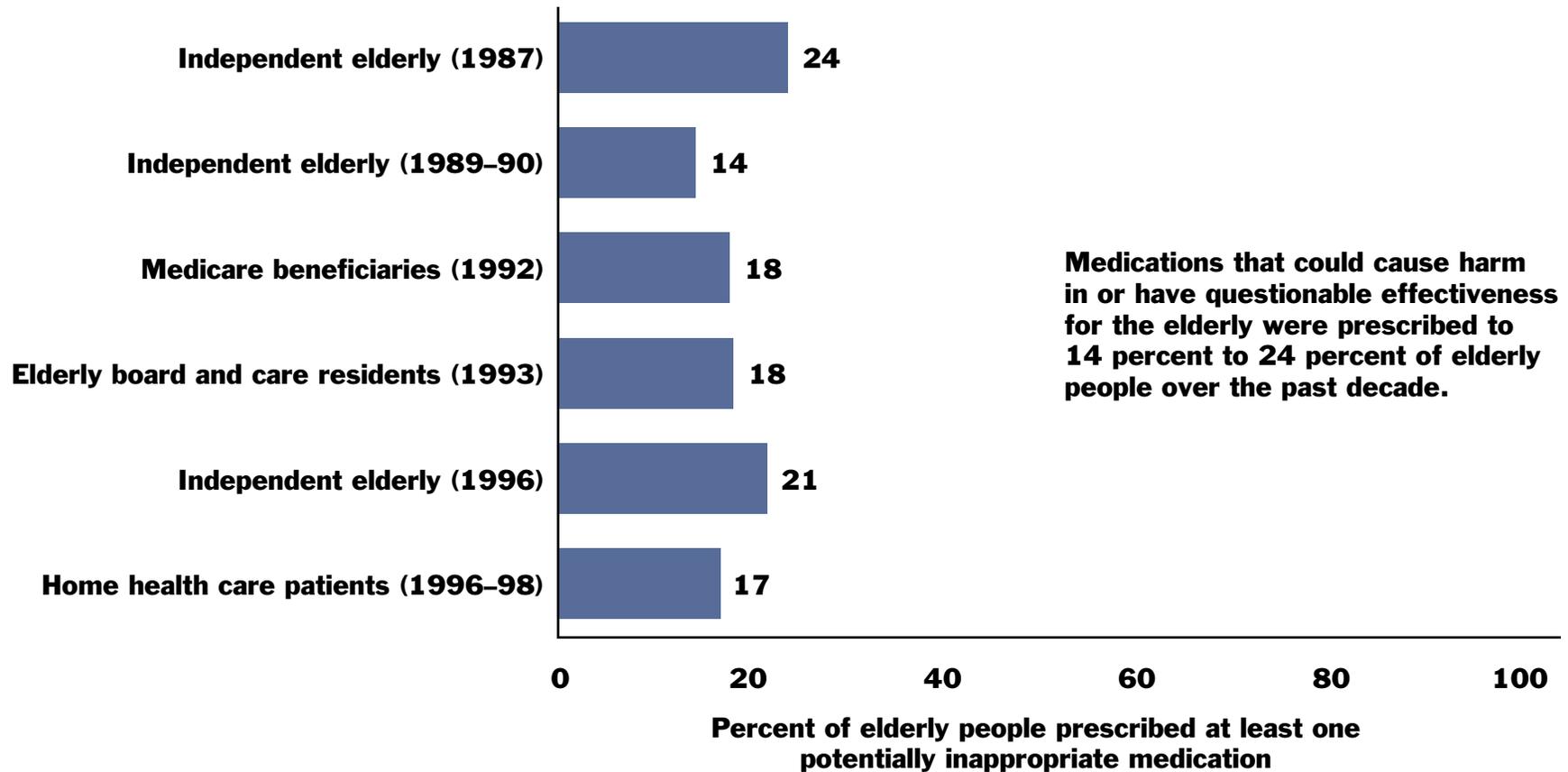
Sources: Wilcox, Himmelstein, and Woolhandler 1994; Stuck et al. 1994; GAO 1995; Spore et al. 1997; Zhan et al. 2001; Meredith et al. 2001.

Implications: Much of the drug-related injury in elderly people is avoidable (Lindley et al. 1992). Drug utilization review programs are one mechanism for accomplishing this, both to alert pharmacists about potentially inappropriate drugs before prescriptions are filled, and to provide feedback to physicians so that they can change their prescribing practices in the future.



Chart 2-6

Potentially Inappropriate Prescribing for the Elderly



Sources: Wilcox, Himmelstein, and Woolhandler 1994; Stuck et al. 1994; GAO 1995; Spore et al. 1997; Zhan et al. 2001; Meredith et al. 2001. Independent elderly means noninstitutionalized people age 65 and older.

Chapter 3

Access and Timeliness

. . . the benefits of American medicine are available only to those with access to the health care system.

— American College of Physicians/American Society of Internal Medicine, 2000

Chapter 3

Access and Timeliness: Introduction

This chapter encompasses two concepts that are closely related to health care quality: the ability to obtain needed care and minimizing unnecessary delays in getting care. The quality of health care hardly matters if people do not have timely access to needed services in the first place. *Due to overlapping subject matter, some of the charts illustrating these concepts also can be found in Chapters 1, 4, and 5 as noted below.*

Nearly 39 million Americans—one in seven—lacked health insurance coverage during 2000 (U.S. Census Bureau 2001). Moreover, certain groups are more likely to be uninsured: younger adults (age 18–24), those with lower levels of education, people of Hispanic ethnicity, and those who work part-time (ACP/ASIM 2000).

Those who lack health insurance face financial barriers that cause them to delay or forgo needed medical care and preventive services (ACP/ASIM 2000; Charts 3–1 to 3–4). They also are less likely to have a regular provider of health care, another risk factor for not getting timely care (IOM 1993; Chart 3–5). Lack of dental insurance and cost are main reasons that one-third of Americans don't see a dentist (Chart 3–7).

Even when people have financial access to the health care system, delays in treatment can be detrimental to health outcomes. For example:

- Medicare patients with pneumonia have a reduced risk of death when they get antibiotics within eight hours of admission to the hospital (Chart 1–7).
- Heart attack victims who get clot-dissolving drugs within an hour after their symptoms occur have significantly better survival than those who don't get reperfusion until 7 to 12 hours later (Chart 1–14).
- Starting prenatal care in the first trimester allows for early detection of risk factors that are amenable to treatment (Chart 3–6).

In addition to objective measures, one of the best ways to measure these concepts is to ask patients about their experiences (Chart 4–4). Up to a quarter of the insured report access problems, especially Asian and Hispanic parents who do not speak English as a first language (Chart 5–7).

Access and Timeliness: Summary of Charts and Findings

Charts 3–1 to 3–3: Effect of Being Uninsured on Access to Primary and Preventive Care—Uninsured adults (non-elderly) were up to three times more likely than insured adults to report not being able to see a doctor when needed due to cost and not receiving recommended preventive care during 1997–1998.

Chart 3–4: Unmet Needs of Children with Special Health Care Needs—Children with special health care needs were three times more likely to report being unable to get needed health care during 1994–1995 if they were uninsured.

Chart 3–5: Effect of Having a Regular Source of Health Care on Access to Preventive Care—Adults with a regular physician or clinic were up to five times more likely to receive preventive care in 1998 than those without a regular source of health care.

Chart 3–6: Timely Initiation of Prenatal Care—The proportion of women who initiated prenatal care in their first trimester of pregnancy increased 7 percentage points from 1980 to 1999, with the greatest improvement (up to 14 percentage points) among blacks, Hispanics, and Native Americans, who had the greatest historical deficits in prenatal care.

Chart 3–7: Dental Care—One-third of all Americans and over half of those with low income did not have a dental visit in 1999. Lack of dental insurance coverage and cost were cited as major barriers.

Charts in Other Chapters

Chart 1–7: Antibiotic Treatment of Pneumonia—Fourteen percent of Medicare patients hospitalized for pneumonia did not receive an antibiotic within eight hours of hospital arrival in the middle-range state during 1998–1999.

Chart 1–14: Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack—Certain hospitals reduced the median time to start thrombolytic therapy by 40 percent, from 62 to 38 minutes after hospital arrival, from 1990 to 1999.

Chart 4–4: Consumer Assessment of Health Plans, Ratings of Access and Timeliness—Problems with access to and timeliness of health care were reported by about 15 percent of the elderly in Medicare plans and children in commercial plans and by about 25 percent of adults in commercial and Medicaid plans in 2000.

Access and Timeliness

Effect of Being Uninsured on Access to Primary and Preventive Care

Why is this important? Nearly 39 million Americans—or one in seven—reported that they lacked health insurance coverage during the year 2000 (U.S. Census Bureau 2001). Research shows that uninsured adults face financial barriers that cause them to delay or completely forgo getting needed medical care, including preventive care services (ACP/ASIM 2000).

Findings: Uninsured adults (non-elderly) were up to three times more likely to report not seeing a physician when needed and not receiving recommended preventive services than those with public or private insurance coverage during 1997–1998. Unmet health care needs were greatest for those who had been uninsured for a year or longer. There were also deficits in access to primary care and some preventive services for those who were uninsured less than a year (data on short-term uninsured are not shown for preventive care). Source: Behavioral Risk Factor Surveillance System (Ayanian et al. 2000).

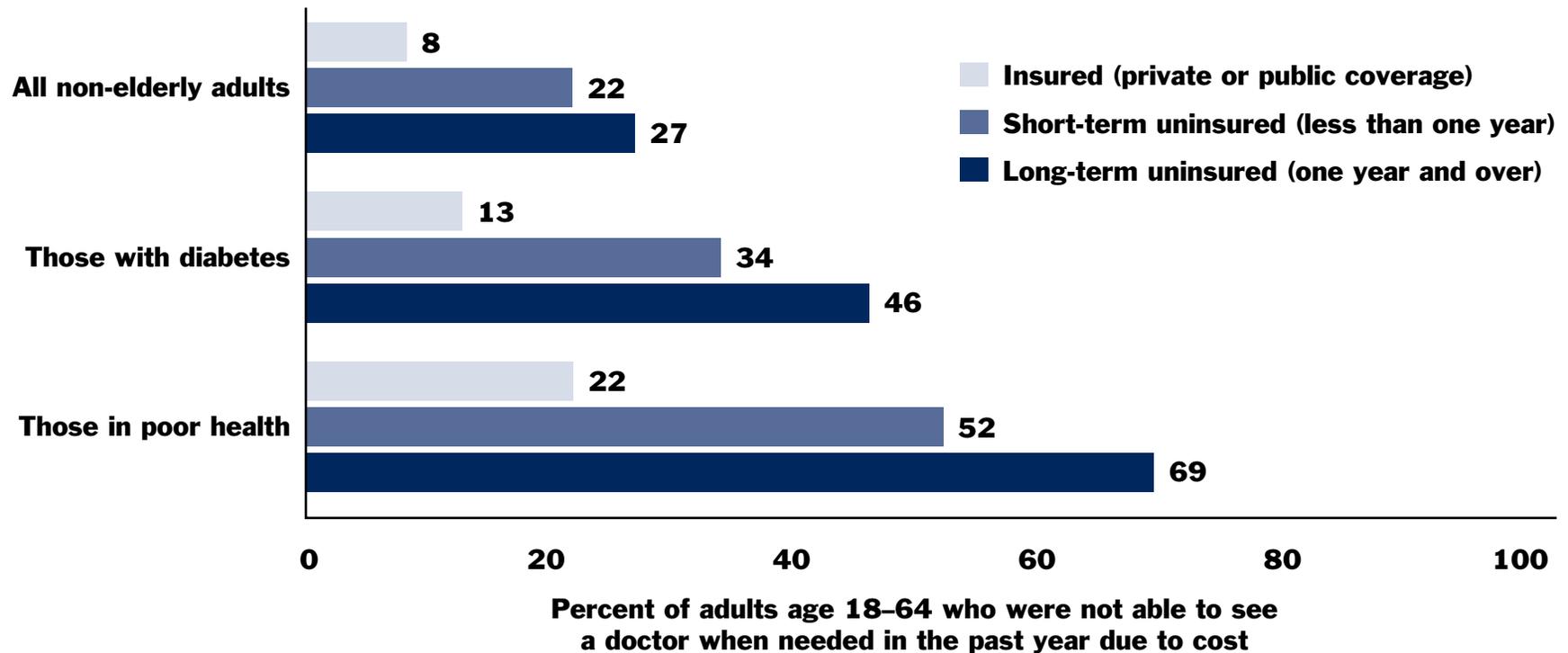
Implications: Improving the quality of health care depends in some measure on improving public or private insurance coverage for the uninsured. Of particular concern are the uninsured in poor health and with chronic conditions such as diabetes that require regular medical care and follow-up.



Chart 3-1

Effect of Being Uninsured on Access to Primary Care

Uninsured adults (non-elderly) were up to three times more likely to report that they could not see a physician in 1998 due to cost, compared to those with public or private insurance coverage. Deficits in access were particularly great for those with chronic conditions such as diabetes and those in poor health.



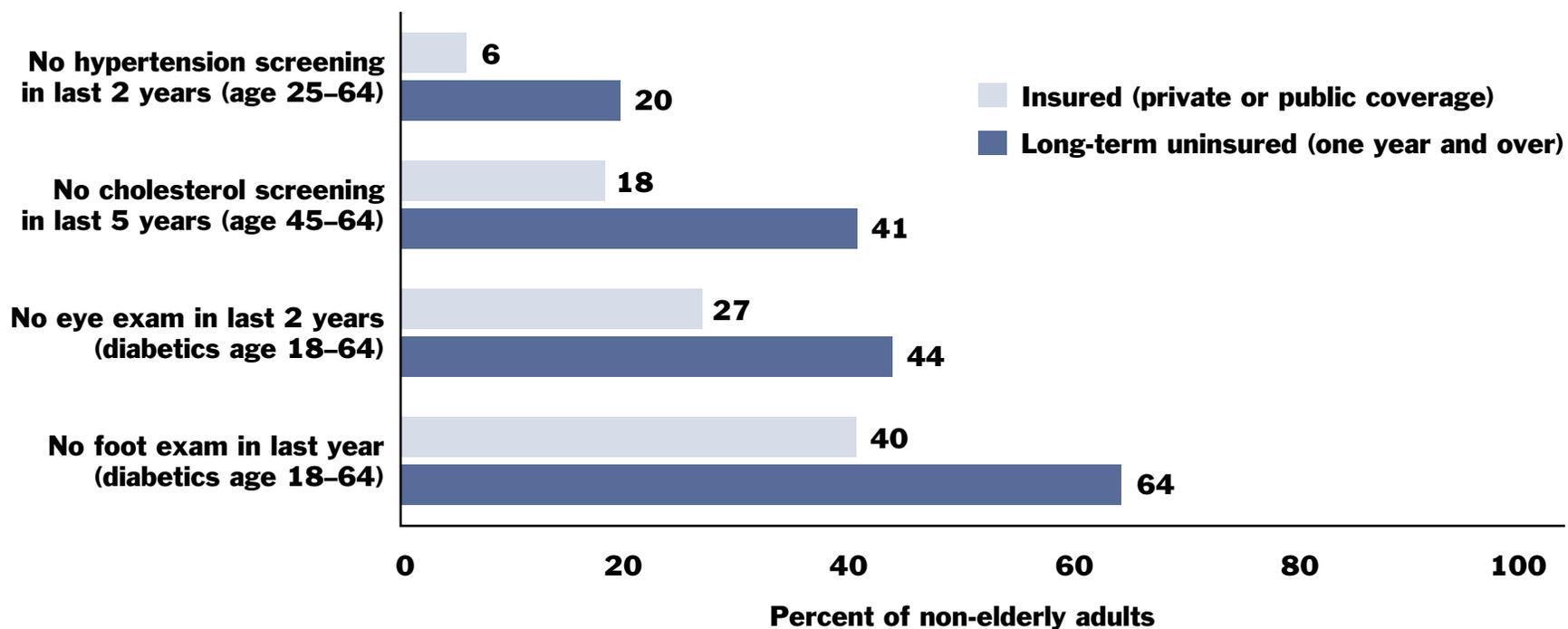
Source: Behavioral Risk Factor Surveillance System. Adapted with permission from Ayanian et al. 2000. Copyrighted 2000, American Medical Association.



Chart 3-2

Effect of Being Uninsured on Access to Preventive Care (Part I)

Uninsured adults were up to three times more likely to report not receiving recommended clinical preventive services during 1997–1998 as compared to adults with public or private insurance coverage.



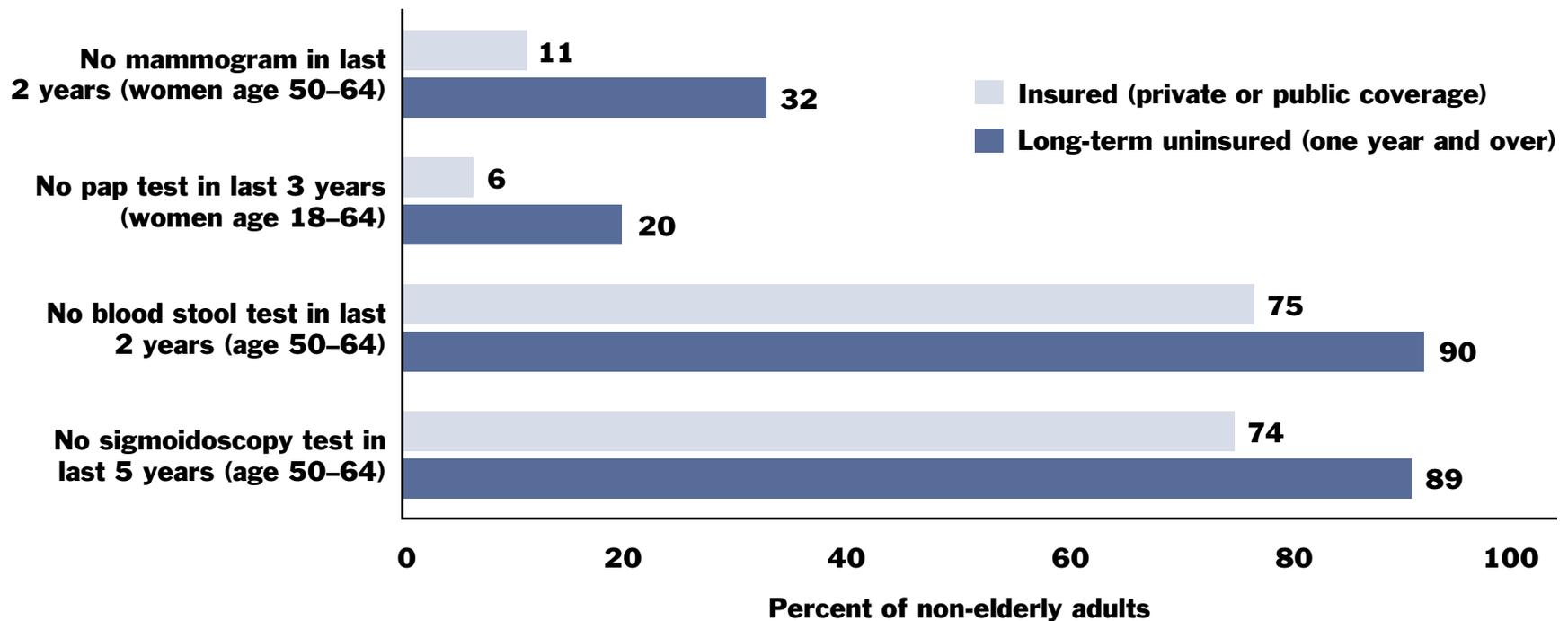
Source: Behavioral Risk Factor Surveillance System (Ayanian et al. 2000).



Chart 3-3

Effect of Being Uninsured on Access to Preventive Care (Part II)

Uninsured adults were up to three times more likely to report not receiving recommended clinical preventive services during 1997–1998, as compared to adults with public or private insurance coverage.



Source: Behavioral Risk Factor Surveillance System (Ayanian et al. 2000).

Access and Timeliness

Unmet Needs of Children with Special Health Care Needs

Why is this important? Children with special health care needs are defined as those at increased risk for chronic physical, developmental, behavioral, and/or emotional conditions that require health and related services of a different type and/or intensity than other children (McPherson et al. 1998). Access to appropriate medical care is especially important for such children.

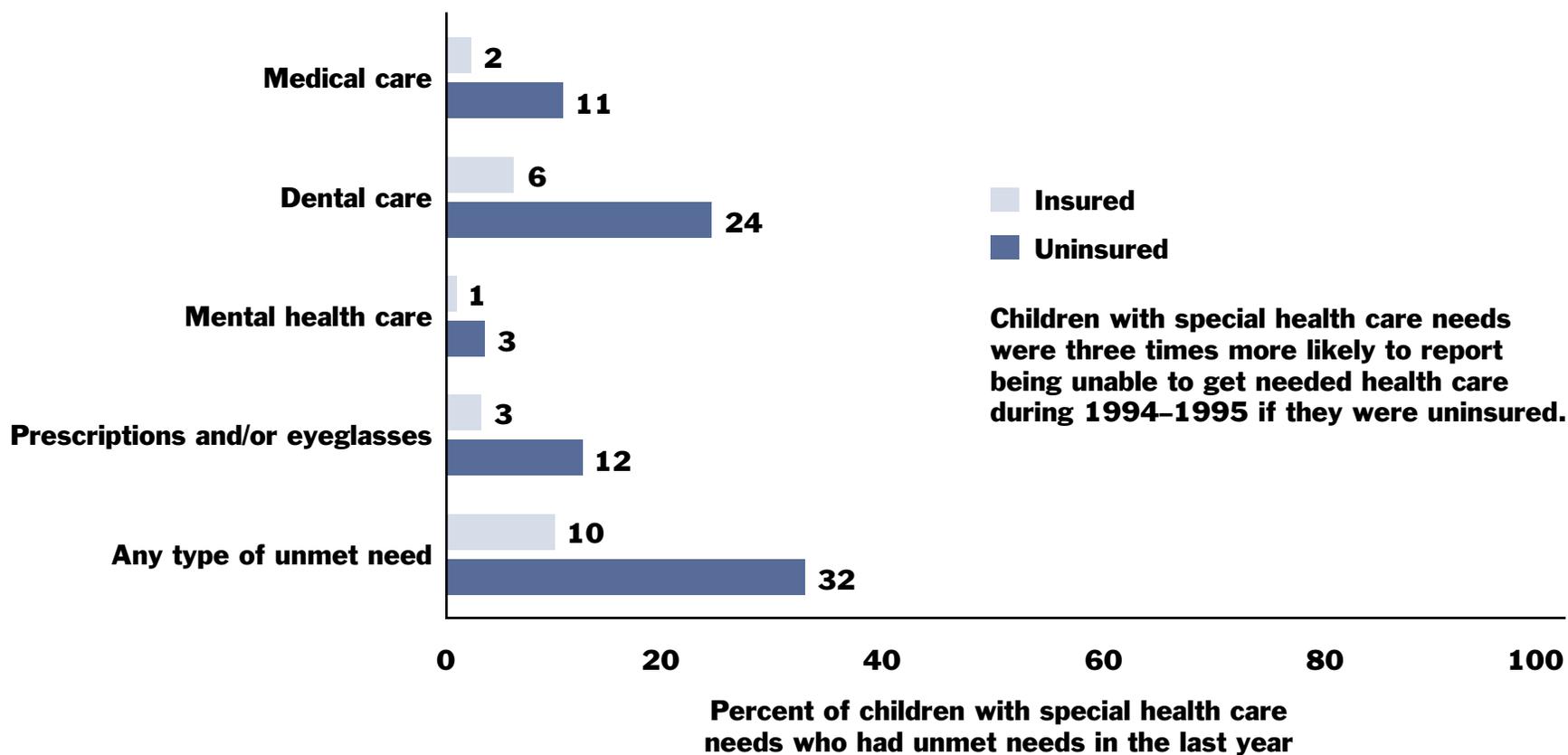
Findings: Children with special health care needs who lacked health insurance were three times more likely than similar children with insurance to report at least one unmet health care need. Source: National Health Interview Survey on Disability (Newacheck et al. 2000).

Implications: Quality matters little if children cannot obtain needed care in the first place. Improving insurance coverage is important to ensure that children with special needs are able to obtain timely and appropriate care.



Chart 3-4

Unmet Needs of Children with Special Health Care Needs



Source: National Health Interview Survey on Disability (Newacheck et al. 2000).

Access and Timeliness

Effect of Having a Regular Source of Health Care on Access to Preventive Care

Why is this important? Having a regular place to go for health care—such as a physician’s office or clinic—is an even more powerful predictor of whether someone receives preventive care services than having health insurance coverage (Breen et al. 2001). Nearly 18 percent of adults under age 65 lacked a regular source of health care in 1998–1999; this rate was higher among males (24%), Hispanics (29%), and the uninsured (47%) (Eberhardt et al. 2001). In contrast, a much smaller percentage of adults age 65 and over—who have near-universal insurance coverage through Medicare—lack a regular source of health care (4% in 2001) (CDC 2002b).

Findings: Adults with a regular source of health care were up to five times more likely to receive preventive care—such as mammograms, pap smears, and colorectal cancer screening—than those without a regular health care provider in 1998. These differences persisted even among older adults who have near-universal Medicare coverage. Source: National Health Interview Survey (Breen et al. 2001).

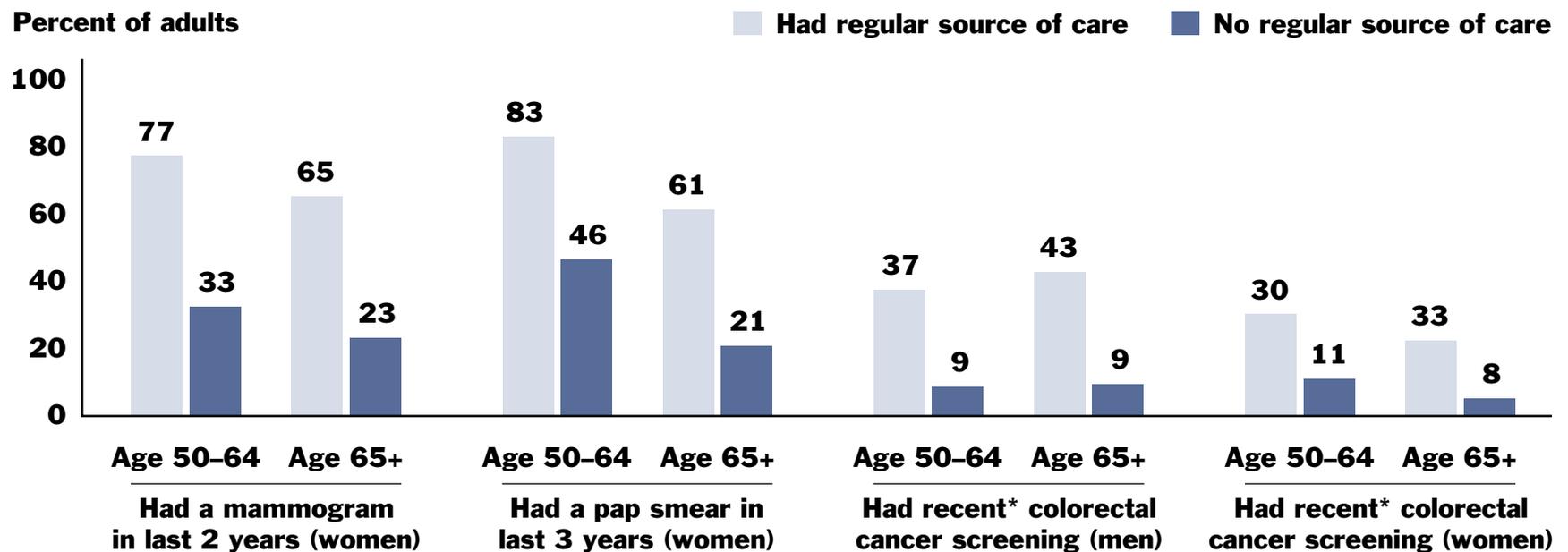
Implications: Having health insurance coverage and a regular source of health care are both important to assure access to preventive care (O’Malley et al. 2001). The importance of a regular health care provider can be seen in the fact that a doctor’s recommendation greatly influences whether people receive preventive care (Hawley et al. 2000).



Chart 3-5

Effect of Having a Regular Source of Health Care on Access to Preventive Care

Adults who had a regular physician or clinic were up to five times more likely to receive preventive care in 1998 than those without a regular source of care. Older adults who are covered by Medicare also were less likely to receive preventive care if they did not have a regular source of care.



Source: National Health Interview Survey (Breen et al. 2001). *Recent colorectal cancer screening means a fecal occult blood test in the last two years or screening endoscopy in the last three years. Hospital emergency departments are not considered a usual source of care.

Access and Timeliness

Timely Initiation of Prenatal Care

Why is this important? Early initiation of prenatal care during the first three months of pregnancy allows for identification of high-risk factors that are amenable to intervention, such as smoking, substance abuse, high blood pressure, and diabetes. For example, pregnancy-induced hypertension occurs in 5 percent to 10 percent of pregnancies. Screening for high blood pressure during the first trimester of pregnancy allows better diagnosis of preeclampsia to prevent complications such as seizures or death (McGlynn et al. 2000).

Findings: Timely initiation of prenatal care increased 7 percentage points over the past two decades for the U.S. population as a whole, from 76 percent of live births in 1980 to 83 percent in 1999. Certain racial/ethnic groups show generally lower but greatly improving rates of early prenatal care, with rates increasing up to 14 percentage points among non-Hispanic blacks (from 61% to 74%), Hispanics (from 60% to 74%), and Native Americans (from 56% to 70%). Source: National Vital Statistics System (Eberhardt et al. 2001).

Implications: Improvement in timely prenatal care may be attributed in part to expansion of Medicaid coverage for low-income pregnant women of all races (Dubay et al. 2001), as well as greater general awareness of the benefits of prenatal care. It is unclear, however, whether increases in timely prenatal care will result in improved birth outcomes, such as low birthweight, without also addressing other socioeconomic and behavioral factors that influence maternal and child health (Dubay et al. 2001).

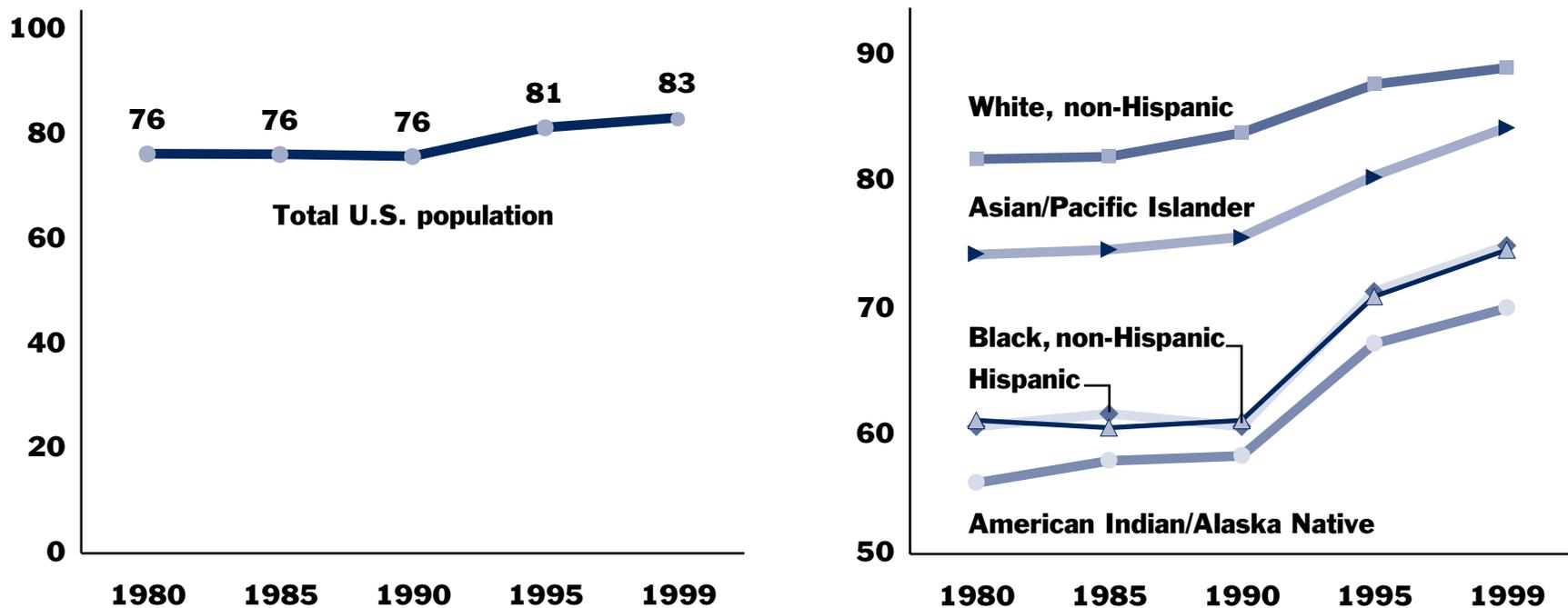


Chart 3-6

Timely Initiation of Prenatal Care

The proportion of women who obtained prenatal care during their first three months of pregnancy increased 7 percentage points from 1980 to 1999, with improvement of up to 14 percentage points among blacks, Hispanics, and American Indians/Alaska Natives.

Prenatal care in first trimester—percent of mothers of infants born live 1980-1999



Source: National Vital Statistics System (Eberhardt et al. 2001).

Effectiveness: Staying Healthy

Dental Care

Why is this important? Oral health is integral to general health. Oral health ailments affect more Americans than any other health problem. Dental caries (tooth decay) is the most common chronic childhood disease—five times more common than asthma. Untreated tooth decay can cause abscesses and infections, pain, dysfunction, and low weight. Dental problems result in the loss of almost 2.5 million workdays each year (NIDCR 2000; PFP 2001).

Oral diseases do not improve without treatment. Almost 30 percent of older adults no longer have their natural teeth because of tooth decay and gum disease. Regular dental care is important to help prevent and treat oral health problems. Dental sealants (a protective coating applied to the teeth) reduce tooth decay by over 70 percent, yet less than a quarter of children have them (NIDCR 2000; PFP 2001).

Findings: One-third of Americans did not visit a dentist in 1999, including over half of those with low income and one-quarter of those who were not poor. Access to dental care was somewhat higher for children but lower in the elderly. Source: National Health Interview Survey (Eberhardt et al. 2001).

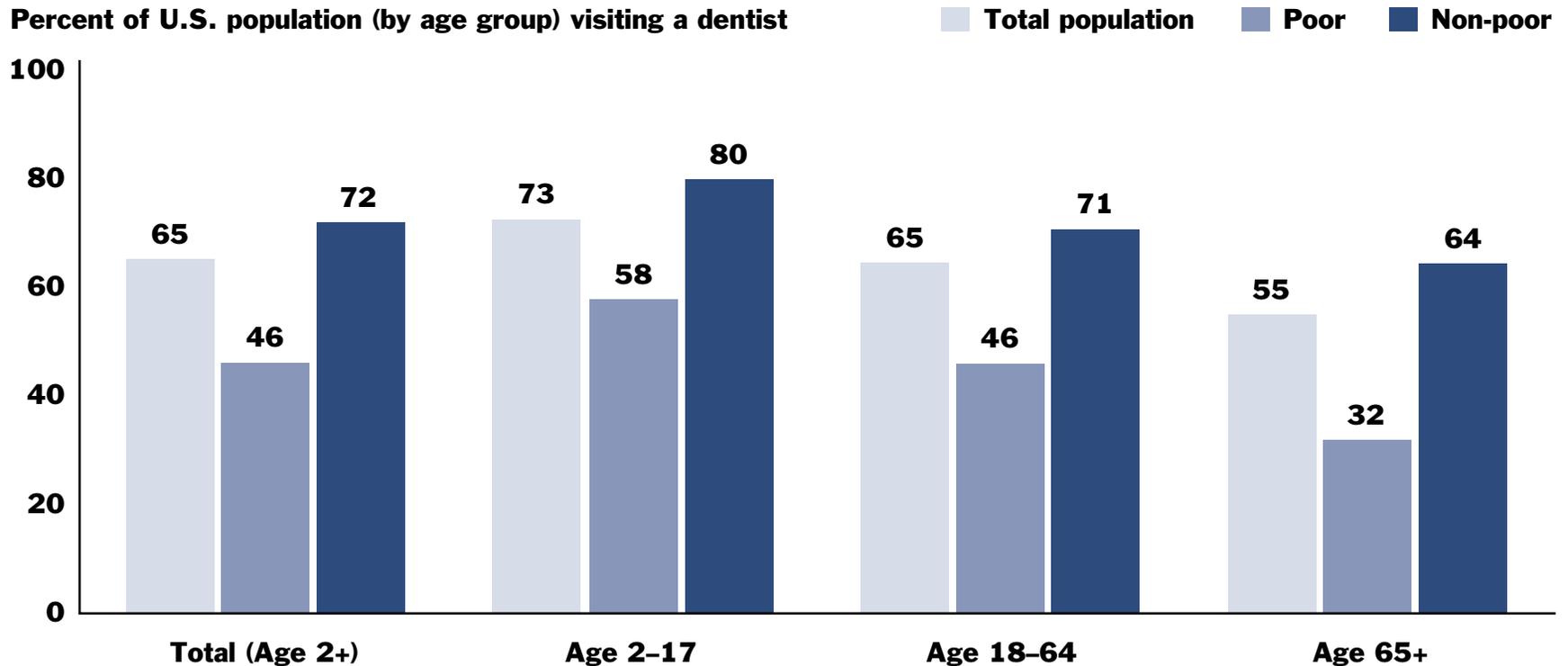
Implications: Improving access to dental care is important to improving oral health. In a recent survey, the top three reasons for not visiting a dentist were lack of dental insurance, absence of teeth, and cost (PFP 2001). Over 108 million Americans lack dental insurance—more than double the number who lack health insurance (NIDCR 2000). Other factors hampering access include unequal distribution of dentists, lack of public “safety-net” dental providers, and low participation by dentists in Medicaid programs for low-income individuals and families (Colmers et al. 1999; Oral Health America 2002). Caregivers of low-income children enrolled in Medicaid report difficulty finding a dentist and scheduling an appointment as well as a lack of transportation (Modifi, Rozier, and King 2002).



Chart 3-7

Dental Care

One-third of all Americans and over half of those with low income did not have a dental visit in 1999. Lack of insurance coverage and cost were cited as major barriers.



Source: National Health Interview Survey (Eberhardt et al. 2001). “Poor” means income below the federal poverty threshold. “Non-poor” means income 200 percent or greater than poverty. The category “near poor” was omitted for clarity.

Chapter 4

Focus on the Patient

What patients experience, and what they think of that experience, should also matter . . . because that experience, as much as the technical quality of care, will determine how people use the health care system and how they benefit from it.

—Margaret Gerteis and colleagues, 1993

Chapter 4

Focus on the Patient: Introduction

Quality of health care has two major dimensions: the technical proficiency with which it is delivered, and the subjective experience of patients who have encounters with health care professionals and institutions (Gerteis et al. 1993). “Both technical care and interpersonal interactions should be shaped to meet the needs and preferences of individual patients,” according to the Institute of Medicine (2001a). This chapter focuses on patients’ experience with their care.

An important aspect is the degree to which patients and their health care providers establish a partnership “to ensure that decisions respect patients’ wants, needs, and preferences and that patients have the education and support they need to make decisions and participate in their own care” (IOM 2001b). There are, unfortunately, only limited data nationally to measure this concept in specific circumstances.

Much work has been done to measure patient experience globally among health plan members and hospital patients.

- The Consumer Assessment of Health Plans survey (CAHPS®), which was developed with federal government support, is now being used by many health plans as well as public and private purchasers to measure the

responsiveness of health plans and their participating providers to consumer needs and expectations. Over 90 million Americans can now get CAHPS® ratings of health plans available to them (Eisenberg 2001).

- Picker Institute surveys are used in hundreds of hospitals nationwide and internationally to better understand patients’ impressions of specific aspects of their hospital care experience. They also have been used as part of an industry-wide effort to stimulate improvements in hospital quality (Cleary et al. 1991; American Hospital Association 1996).
- One objective measure of responsiveness included in this chapter is the average length of a physician office visit.

The quality of nursing home care has been a continuing national concern for some time, but there is little publicly available data on patient experience and quality of life. To fill this gap, a recent national public opinion poll asked about nursing home care among those who had substantial nursing home experience (Charts 4–8 to 4–10).

CAHPS® is a registered trademark of the Agency for Healthcare Research and Quality

Focus on the Patient: Summary of Charts and Findings

Chart 4-1: Perceptions of Health Care Quality—Little more than half of the American public think that the quality of health care in the U.S. is good or excellent. The majority of U.S. physicians said that their ability to deliver high-quality health care has deteriorated.

Chart 4-2: Public Perceptions of the Health Care System—A large majority of people said that hospitals and their own physician were doing a good job in 2000, but many have concerns about the leaders of medicine, health insurers, and managed care. One-third were not confident about their ability to pay for a major illness.

Charts 4-3 to 4-5: Consumer Assessment of Health Plans—In 2000, most health plan members rated their health care highly overall. Ratings were highest among the elderly in Medicare plans and for children in commercial plans. Problems with access to and timeliness of health care were reported by about 15 percent of the elderly in Medicare plans and children in commercial plans and by about 25 percent of adults in commercial and Medicaid plans. From 6 percent to 14 percent of health plan members reported

problems communicating with their physician, while 28 percent to 36 percent reported problems with health plan customer service.

Chart 4-6: Patient Reports of Problems with Hospital Care—Patients at 272 hospitals frequently reported problems with some aspects of their care during 1998–1999.

Chart 4-7: Time Spent with Physician—Physicians spent one to three minutes longer with patients, on average, during office visits in 1999 than a decade earlier, in 1989.

Charts 4-8 to 4-10: Satisfaction with Nursing Home Care—In 2001, among people with substantial nursing home experience: one-third were dissatisfied with the care that they, a family member, or a friend received over the past three years; a large minority reported inadequacies with staffing or mistreatment or abuse of residents by staff; and one-quarter or more reported dissatisfaction with quality of life in the nursing home or a quality problem, such as the development of bed sores.

Focus on the Patient

Perceptions of Health Care Quality

Why is this important? Knowing what physicians and the public think about health care quality helps bring meaningful measures of quality into the context of patient experience.

Findings: Physicians and the general public appear to share a common concern about the quality of American health care in general:

- Little more than half of Americans believe that the overall quality of care in the United States is good or excellent, based on responses to a nationally representative opinion poll of 1,000 Americans conducted in 2001.
- Nearly three in five U.S. doctors agreed with the statement that quality of care has deteriorated over the past five years, based on a survey of 500 American physicians conducted in 2000 as part of a five-country survey. Doctors in Australia, New Zealand, and the United Kingdom (but not Canada) had a slightly more favorable impression of quality.

Sources: Gallup (*National Journal* Poll Track 2001); Commonwealth Fund International Health Policy Survey (Blendon et al. 2001).

Implications: These responses appear to reflect a fundamental gap between the level of quality that people expect from the health care system and what it currently delivers. Perceptions of quality also may be influenced by people's views of access and health insurance coverage. Public concern about the state of the health care system extends across numerous developed countries (Donelan et al. 1999).

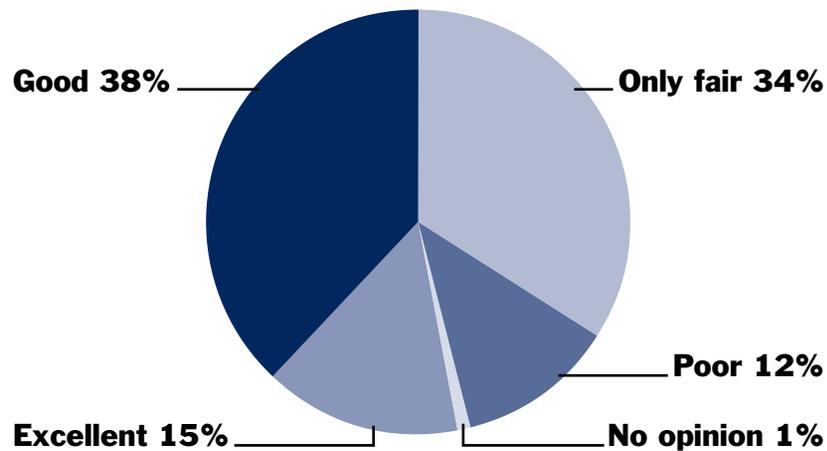


Chart 4-1

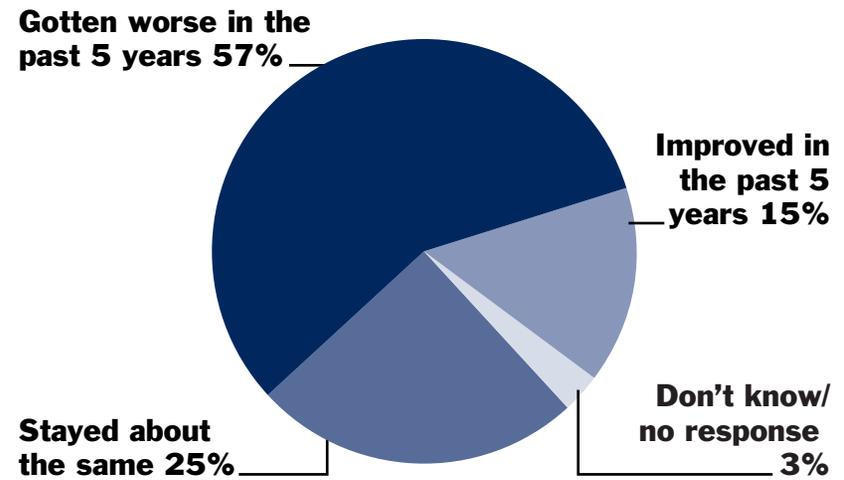
Perceptions of Health Care Quality

Little more than half of the American public thinks that the quality of health care in the U.S. is good or excellent. Likewise, many U.S. physicians are dissatisfied with their ability to deliver high-quality health care.

General public: rating of the overall quality of health care in the U.S. (2001)



Physicians: rating of their ability to provide quality health care (2000)



Sources: Gallup (*National Journal* Poll Track 2001). Sampling error +/-3 percent. Commonwealth Fund International Health Policy Survey (Blendon et al. 2001). Sampling error +/-4 percent.

Focus on the Patient

Public Perceptions of the Health Care System

Why is this important? Knowing what the public thinks about the health care system can help policymakers gauge the need for changes.

Findings:

- About three-quarters of Americans are confident that hospitals are doing a good job, a rating that has declined only slightly from 77 percent in 1997 to 72 percent in 2000.
- Satisfaction with one's last physician visit has remained relatively high over the past two decades, rising from 88 percent in 1978 to 93 percent in 1982, down to 84 percent in 2000.
- In contrast to views about their personal physician, Americans' confidence in the people running medicine has declined from 73 percent in 1966 to 44 percent in 2000.
- Confidence in health insurers has declined from 55 percent in 1997 to 39 percent in 2000. Over half of people think that managed care will harm the quality of health care.
- Although nearly one-third of people are not confident about their ability to pay for a serious illness, confidence has increased since 1978, when about half of people expressed this concern.

Sources: Various nationally representative public opinion polls (Blendon and Benson 2001).

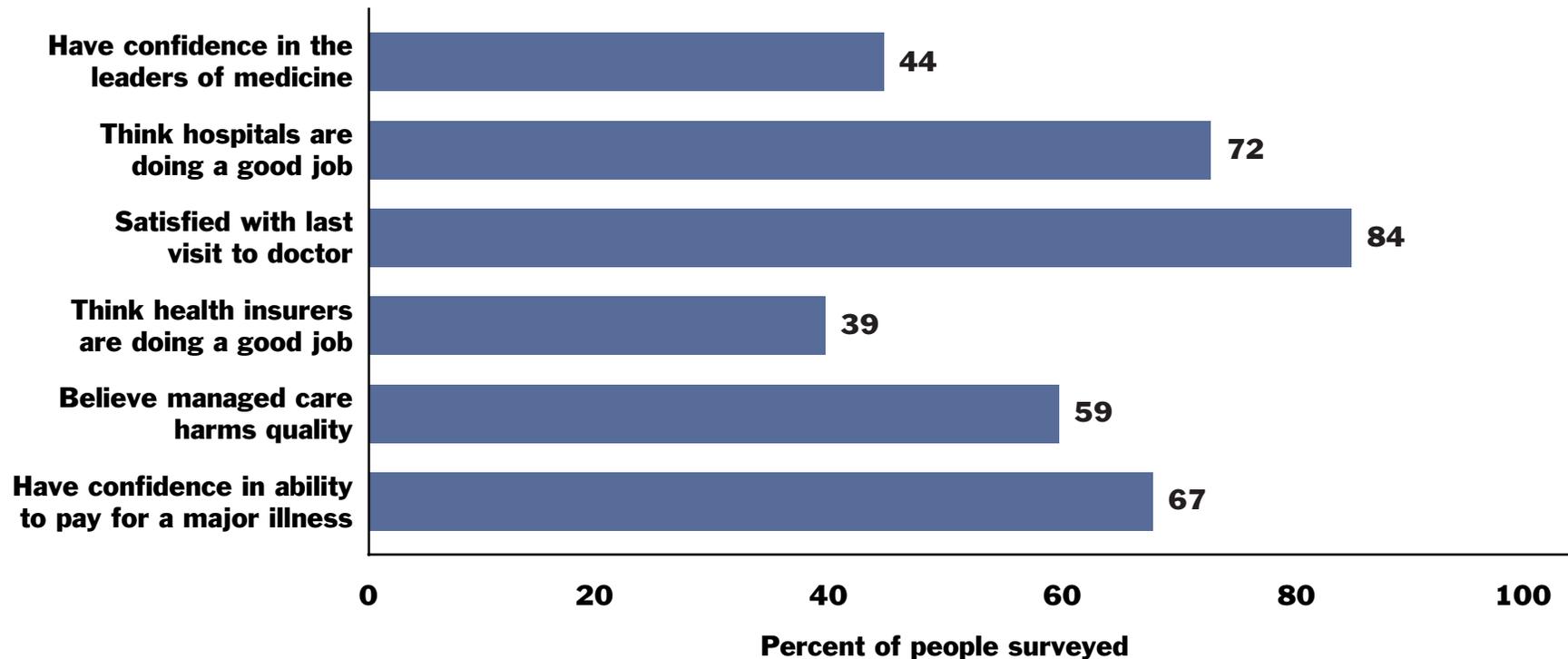
Implications: Public confidence in institutions of all types has declined over the past few years, but hospitals and personal doctors appear to have maintained relatively high standing. While individuals report generally positive experience with medical care, public confidence and trust in the system at large is eroding.



Chart 4-2

Public Perceptions of the Health Care System

A large majority of people said that hospitals and their own physician were doing a good job in 2000, but many had concerns about the leaders of medicine, health insurers, and managed care. One-third were not confident about their ability to pay for care.



Source: Various nationally representative public opinion polls conducted in 2000 (Blendon and Benson 2001).

Focus on the Patient

Consumer Assessment of Health Plans

Why is this important? When making decisions about health care providers and plans, consumers are often most interested in learning about the experiences of other people like themselves (KFF/AHRQ 1996). In response, many health plans as well as public and private purchasers now use a standard survey known as the Consumer Assessment of Health Plans (CAHPS®) to measure the responsiveness of health plans and their participating providers.

Findings: Most health plan members rated their health care highly overall in 2000, but fewer gave high ratings to their health plan. Ratings were generally higher among the elderly in Medicare health plans and children in commercial health plans (childrens' experience was rated by a parent). Sources: CMS 2001b; NCQA 2001b. Specific gaps in consumer expectations include the following:

- From 15 percent to 27 percent reported problems getting needed care.
- From 13 percent to 22 percent reported only sometimes or never getting care as quickly as desired.
- From 6 percent to 14 percent reported that their doctor only sometimes or never communicated well.
- From 28 percent to 36 percent reported problems with their health plan customer service.

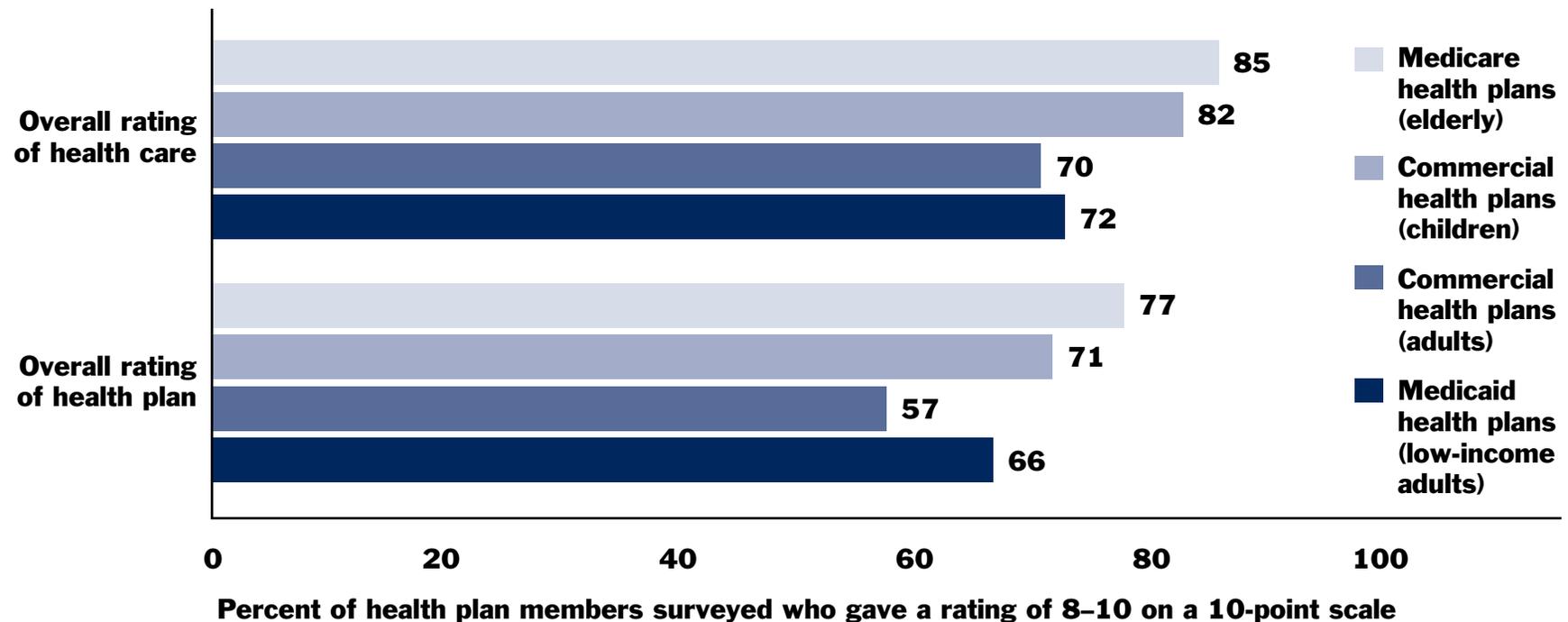
Implications: Quality of care can be assessed by consumers. This information has been shown effective in helping consumers make health plan choices and in helping health plans assess the need to improve their performance (Guadagnoli et al. 2000; Scanlon et al. 2001).



Chart 4-3

Consumer Assessment of Health Plans Overall Ratings

In 2000, most health plan members rated their health care highly overall, though fewer rated their health plan highly. Ratings were higher among the elderly in Medicare plans and for children in commercial plans.



Sources: CMS 2001b; NCQA 2001b. Adapted with permission from the National Committee for Quality Assurance.

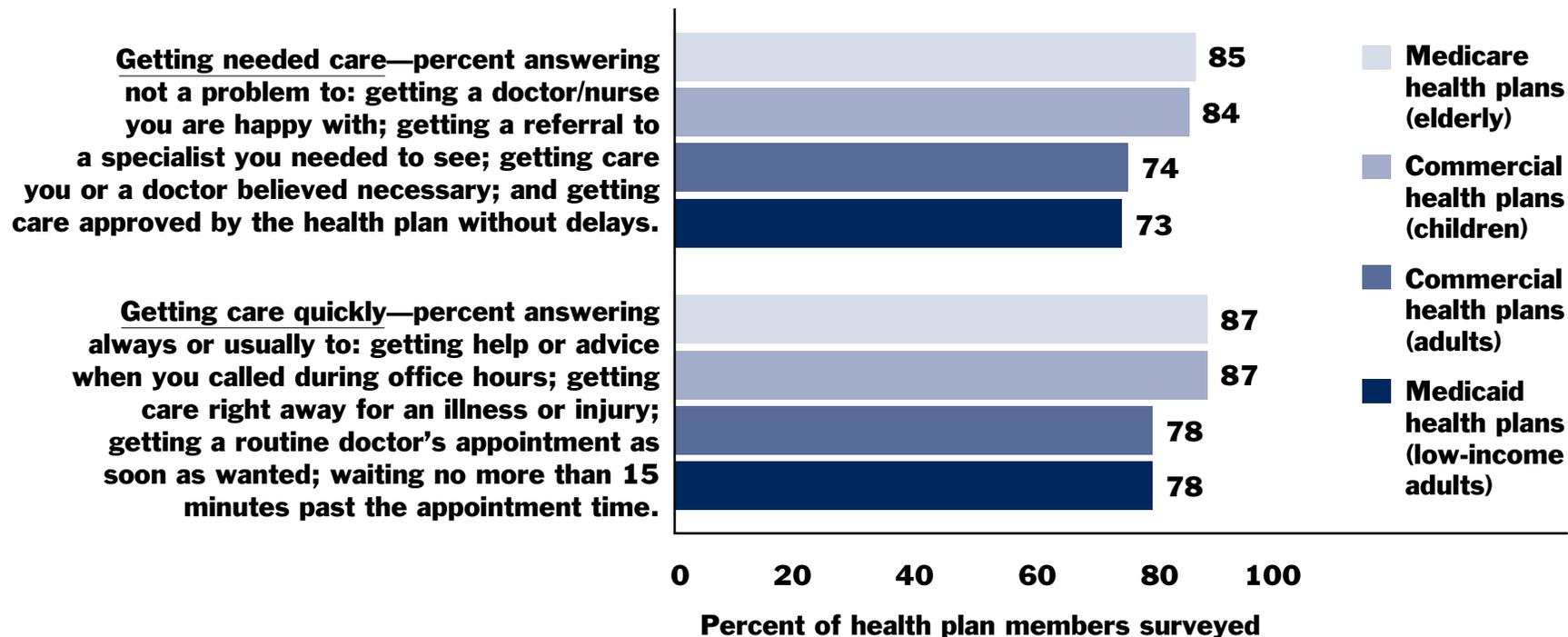


Chart 4-4

Consumer Assessment of Health Plans

Ratings of Access and Timeliness

Problems with access to and timeliness of care were reported by about 15 percent of the elderly in Medicare plans and children in commercial plans, and by about 25 percent of adults in commercial and Medicaid plans in 2000.



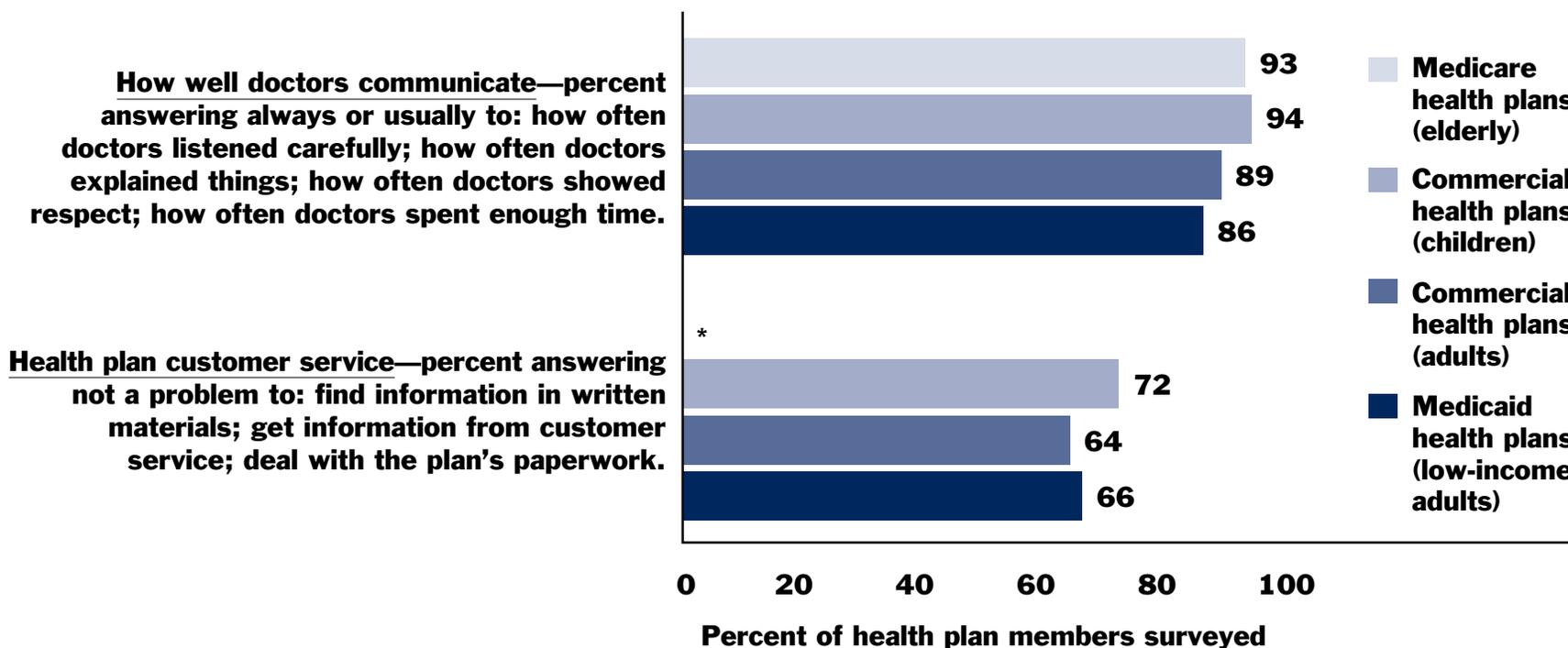
Source: CMS 2001b; NCQA 2001b. Adapted with permission from the National Committee for Quality Assurance.



Chart 4-5

Consumer Assessment of Health Plans Ratings of Physician and Health Plan Communications

From 6 percent to 14 percent of health plan members reported problems communicating with their physician in 2000, while 28 percent to 36 percent reported problems with health plan customer service.



Source: CMS 2001b; NCQA 2001b. Adapted with permission from the National Committee for Quality Assurance. *Comparable data not available for Medicare.

Focus on the Patient

Patient Reports of Problems with Hospital Care

Why is this important? Many hospitals are interested in learning about patients' experiences in an effort to ensure humane caregiving. Picker Institute surveys are used in hundreds of hospitals internationally to better understand patients' impressions of specific aspects of care (Cleary et al. 1991). Though patients are often unable to judge the technical quality of care, their experience is important when assessing vital personal aspects of the health care encounter.

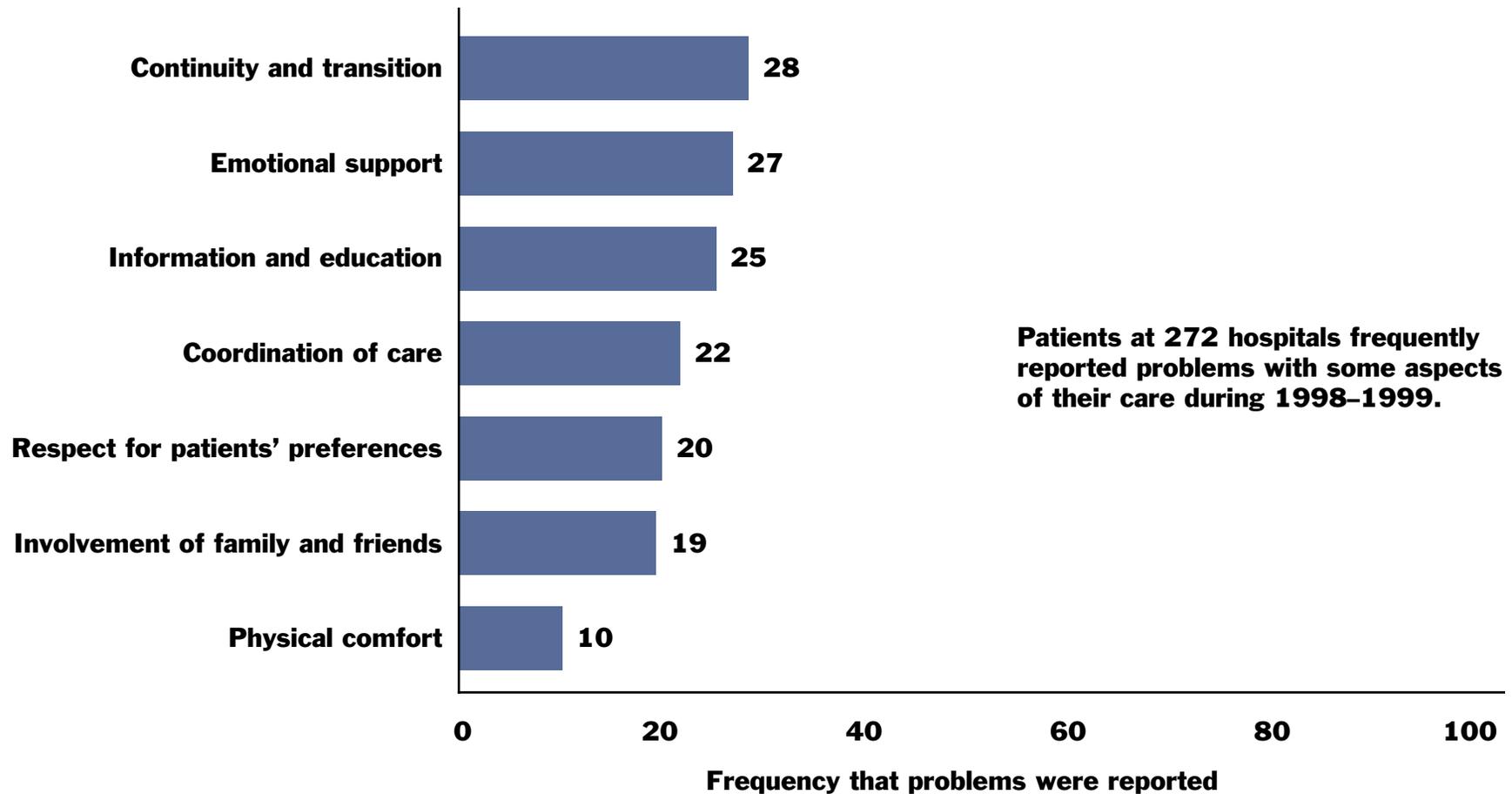
Findings: Patients at 272 hospitals reported problems on 10 percent to 28 percent of the questions asked about seven aspects of care (multiple questions were asked for each aspect of care): (1) continuity and transition of care, e.g., not getting information about medication side effects or danger signals to watch for at home; (2) emotional support, e.g., difficulty discussing anxieties and concerns or lacking confidence in some of the health professionals responsible for their care; (3) information and education, e.g., problems communicating with medical staff; (4) coordination of care, e.g., not being told the name of the doctor in charge; (5) respect for patients' preferences, e.g., failure to involve patients in treatment decisions; (6) involvement of family and friends; and (7) physical comfort, e.g., not being helped to the toilet or inadequate pain management. Source: Picker Surveys (Coulter and Cleary 2001). Results may not be representative of all U.S. hospitals.

Implications: Patients perceive problems in many aspects of hospital care that are not detected in overall questions about satisfaction, demonstrating the importance of asking specific questions about patient experience. Hospitals generally did well in meeting patients' expectations for physical comfort, but did not rate as well in providing emotional support or in preparing patients to leave the hospital.



Chart 4-6

Patient Reports of Problems with Hospital Care



Source: Picker surveys of 272 self-selected U.S. hospitals (Coulter and Cleary 2001). Results may not be representative of all U.S. hospitals.

Focus on the Patient

Time Spent with Physician

Why is this important? The amount of time physicians spend with their patients is one measure of the responsiveness of the health care system to patient needs. A common perception is that recent cost-containment pressures and paperwork burdens are squeezing out time for patient care.

Findings: The average duration of a physician office visit increased from 1989 to 1999 by nearly one minute based on calculations of time and visit data reported by physicians to the American Medical Association's Socioeconomic Monitoring System, and by three minutes based on visit length reported by physicians to the government's National Ambulatory Medical Care Survey.

This upward trend cannot be explained by increases in physician supply, the aging of the population, or the complexity of care for sicker patients. The trend toward longer physician office visits occurred for both new and established patients as well as both routine and complex cases. Sources: Mechanic, McAlpine, and Rosenthal 2001; personal communication with David Mechanic 2001.

Implications: In recent surveys, 42 percent of physicians said that they do not spend enough time with patients to deliver quality care (Blendon et al. 2001), while nearly one-quarter of patients said that the time they spent with their doctor was too short (Donelan et al. 1999). Yet, physicians are spending more time with patients today than ten years ago.

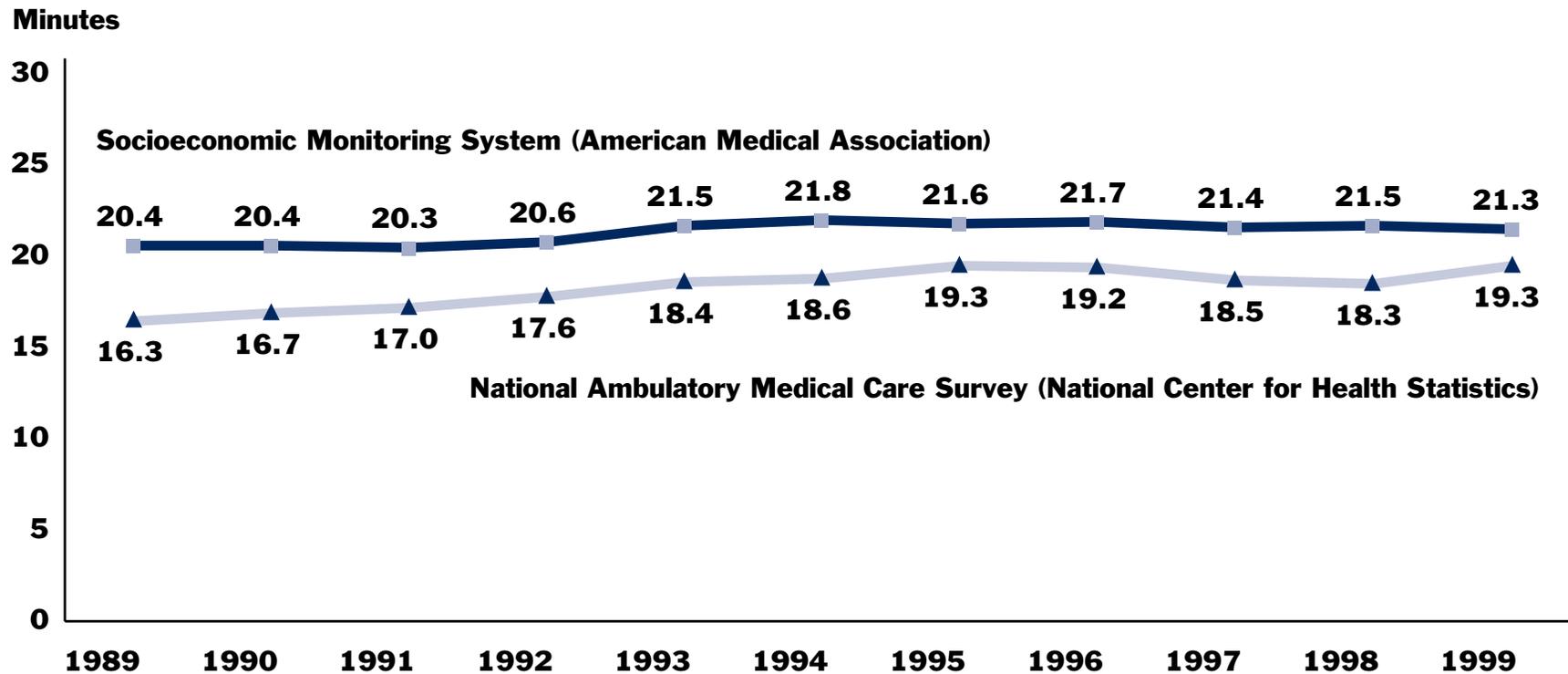
The perception that less time is spent with patients may arise from the need to do more during a patient visit, including provide preventive care and more fully explain a larger number of treatment options as patients ask more questions.



Chart 4-7

Time Spent with Physician

Physicians spent one to three minutes longer with patients, on average, during office visits in 1999 than a decade earlier, in 1989.



Sources: Adapted with permission from Mechanic, McAlpine, and Rosenthal 2001 (1989–1998). Copyright © 2001 Massachusetts Medical Society. All rights reserved. Data for 1999 obtained from the study author.

Focus on the Patient

Perceptions of Nursing Home Care

Why is this important? About 1.5 million Americans reside in nursing homes at any given time—a population that is vulnerable and has many medical and psychosocial needs. Yet little is known about their experiences with care since there is no national standardized survey of nursing home patient experience. To fill this gap, a recent national opinion poll assessed the perceptions of a subgroup of the general population who had substantial nursing home experience, either as a nursing home resident or from regularly visiting family or friends in nursing homes.

Findings: Among those with substantial nursing home experience:

- Over one-third were not satisfied with the care that they or friend or family member had received and would not recommend the nursing home to someone else.
- A sizable proportion reported inadequacies with certain aspects of staffing, living environment, and caregiving. For example, about a quarter reported serious problems such as mistreatment or abuse of residents by nursing home staff.

Source: National Survey on Nursing Homes (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health 2001). The data shown represents a subset of the complete survey results.

Implications: Perceptions of nursing home care are mixed, with a fundamental gap in expectations for a large minority of people with substantial nursing home experience. Feedback such as this can help nursing home administrators focus efforts where improvements can be made. The public as well as state and federal governments may benefit from more complete and ongoing data on nursing home patient experience to better judge and regulate the quality of nursing home care.

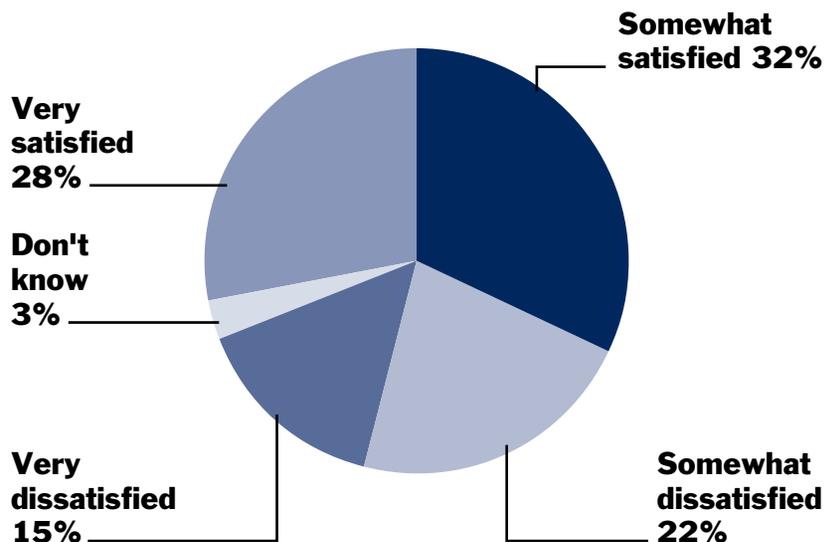


Chart 4-8

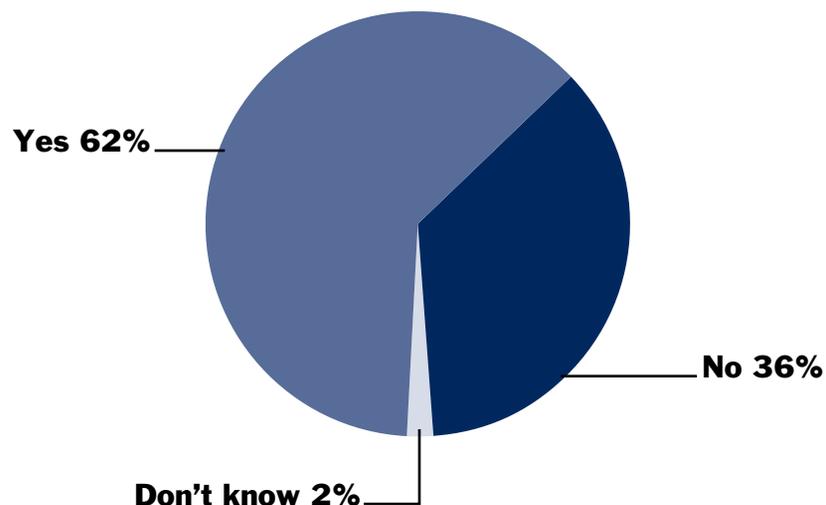
Satisfaction with Nursing Home Care

In 2001, one-third of people with substantial nursing home experience expressed dissatisfaction with the care that they, a family member, or a friend received in the last three years.

Overall, how satisfied are you with the services provided by the nursing home?



Would you recommend this facility to someone else who needs nursing home care?



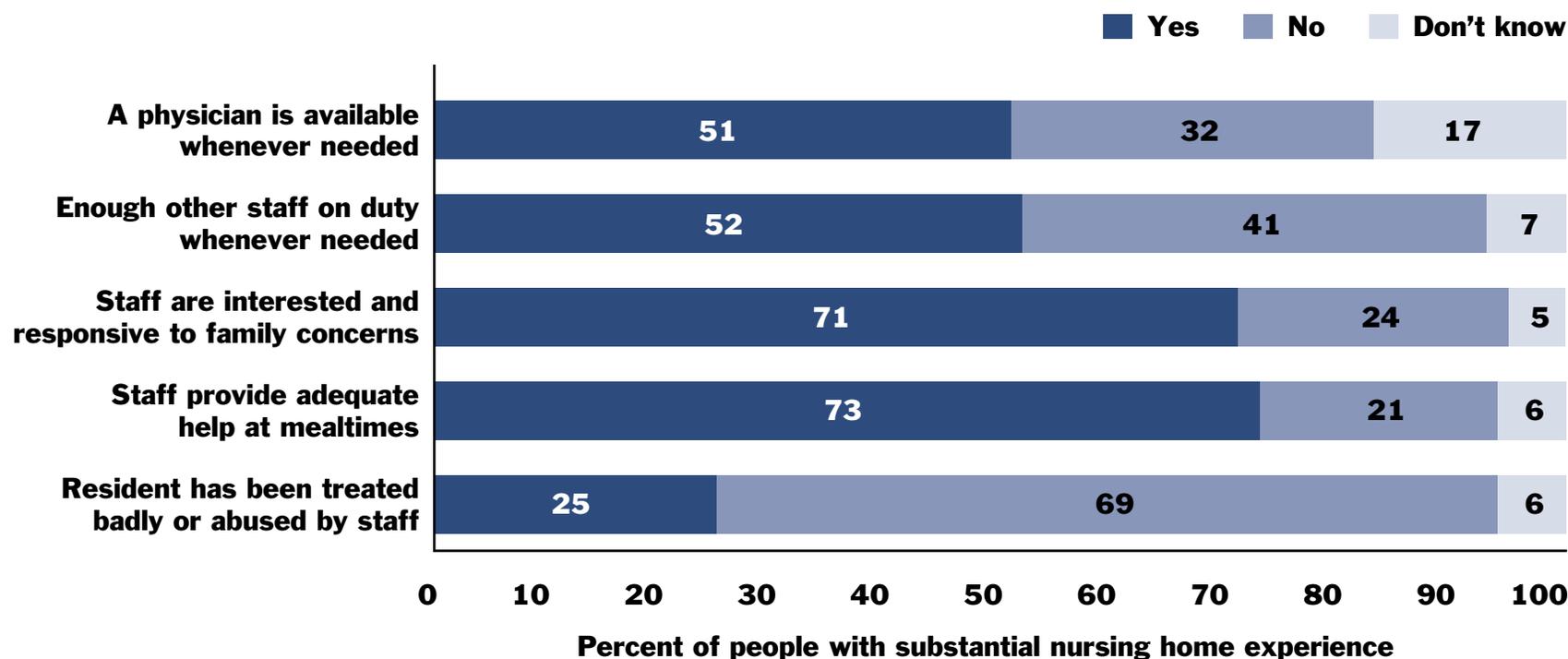
Source: Adapted with permission from National Survey on Nursing Homes (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health, October 2001). Sampling error ± 6 percent. Substantial nursing home experience is defined as those who report that, in the past three years, they have been a resident in a nursing home or have known someone in a nursing home and visited them at least once a month over that time.



Chart 4-9

Ratings of Nursing Home Staff and Staffing Levels

In 2001, a large minority of people with substantial nursing home experience in the last three years reported inadequacies with staffing or mistreatment or abuse of residents by staff.



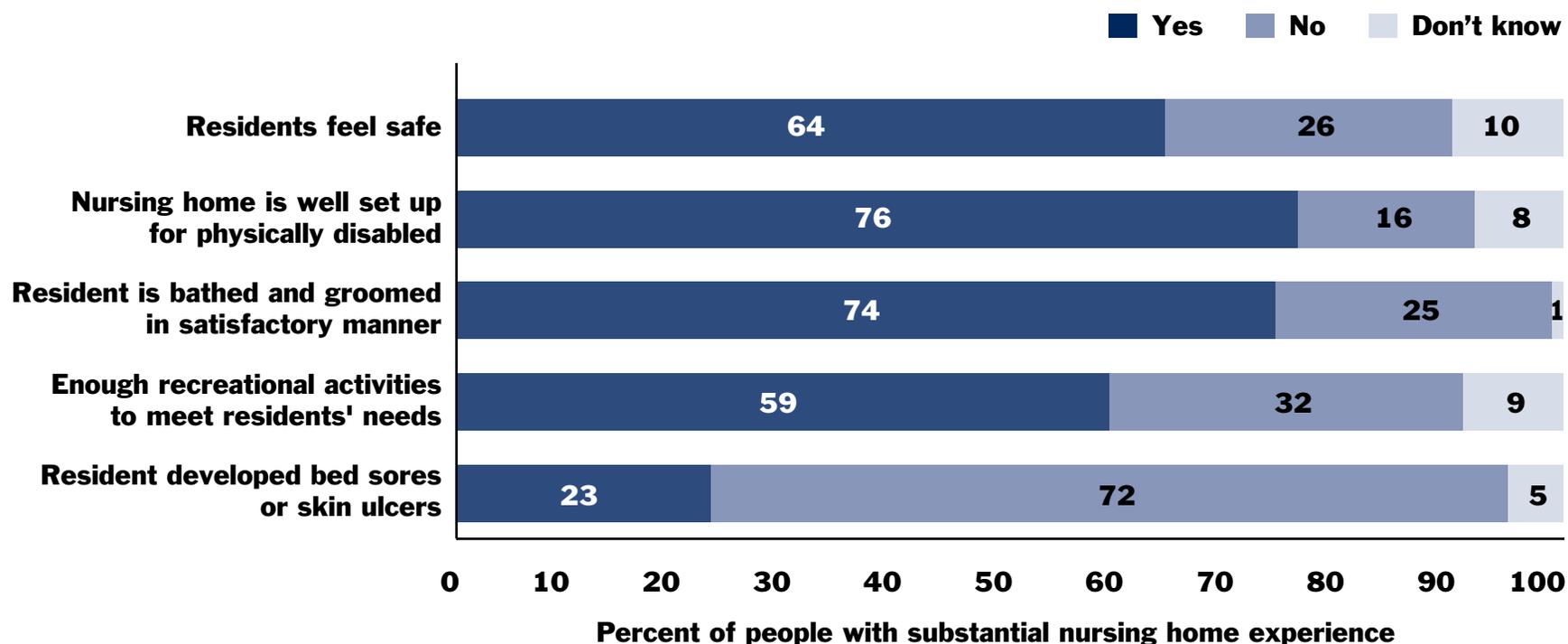
Source: Adapted with permission from National Survey on Nursing Homes (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health, October 2001). Sampling error ± 6 percent. Substantial nursing home experience is defined as those who report that, in the past three years, they have been a resident in a nursing home or have known someone in a nursing home and visited them at least once a month over that time.



Chart 4-10

Nursing Home Quality of Life

In 2001, one-quarter or more of people with substantial nursing home experience in the last three years reported dissatisfaction with quality of life in the nursing home or a quality problem.



Source: Adapted with permission from National Survey on Nursing Homes (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health, October 2001). Sampling error +/-6 percent. Substantial nursing home experience is defined as those who report that, in the past three years, they have been a resident in a nursing home or have known someone in a nursing home and visited them at least once a month over that time.

Chapter 5

Disparities in Health Care

. . . all individuals rightly expect to be treated fairly by social institutions, including health care institutions. The availability of care and quality of services should be based on individuals' particular needs and not on personal characteristics unrelated to the patient's condition or to the reason for seeking care. In particular, the quality of care should not differ because of such characteristics as gender, race, age, ethnicity, income, education, disability, sexual orientation, or location of residence.

—Institute of Medicine, 2001a

Chapter 5

Disparities in Health Care: Introduction

A substantial body of research has demonstrated that minority Americans are worse off than white Americans on a wide variety of indicators of health care access and quality that determine health outcomes (Collins, Hall, and Neuhaus 1999). Research has also found that women sometimes receive less treatment (such as cardiac procedures) than men (Gan et al. 2000).

These findings have provoked debate about the degree to which disparities reflect overt bias in the health care system or other factors, such as distribution of resources or differences in patients' clinical characteristics. Understanding these factors is important to identifying root causes that are amenable to change by the health care system or that require changes in wider social policies impacting health care. For example:

- Socioeconomic factors such as income and education generally are stronger determinants of primary health care use than race or ethnicity alone (Fiscella et al. 2000). Interventions can be targeted to address needs related to these factors, such as transportation to see the doctor.
- Both physician decision-making and patient preferences may account for some of the racial difference in access to cardiac procedures (Sedlis et al. 1997), though differences

in preferences accounted for little of the disparity in access to kidney transplants (Ayanian et al. 1999). Patient preferences may change with better patient communication and education.

- Insurance coverage and ability to pay are necessary but not sufficient conditions for equal treatment, as disparities remain among those who are equally insured.

Disparities in health care can be reduced and even eliminated with concerted effort, as seen in successful efforts to provide mammography and hypertension services equally to all (Fiscella et al. 2000). More examples of successful approaches are needed to guide policy.

The increasing diversity of the United States population—with projections that minority groups will outnumber whites within 50 years, as they already do in California—makes the issue of disparities even more urgent (Smith and Edmonston 1997; Johnson 1999). Most research on racial disparities has focused on African-Americans, which explains its predominance among these charts. Additional research on other minority groups is needed to understand their unique experiences.

Disparities in Health Care: Summary of Charts and Findings

Chart 5–1: Racial/Ethnic Disparity in Preventive

Care—Hispanics and African-Americans are less likely than whites to get smoking cessation counseling and flu shots during 1998–1999. Hispanic women were slightly less likely to get a mammogram than white and African-American women.

Chart 5–2: Racial Disparity in Lung Cancer Surgery and Survival

—Among Medicare patients diagnosed with an early-stage, treatable form of lung cancer in 10 cancer registry areas during 1985–1993, blacks had worse survival outcomes than whites, mainly due to a lower rate of surgery.

Chart 5–3: Racial Disparity in Use of Invasive Heart Procedures

—From 1984 to 1992, black patients with coronary artery disease were less likely than white patients to receive procedures that restore blood flow to the heart muscle, regardless of disease severity, at one teaching hospital.

Chart 5–4: Gender Disparity in Heart Attack

Treatment—Among Medicare beneficiaries hospitalized for heart attack during 1994–1995 who were ideal candidates for drug therapies that are known to be effective in improving survival, women were somewhat less likely

than men to receive most drug therapies and were less likely to receive time-sensitive therapies on a timely basis.

Chart 5–5: Racial Disparity in Access to Kidney

Transplants—White patients were more likely than black patients to be referred for and receive a kidney transplant, regardless of clinical appropriateness or patient preferences, among kidney dialysis patients in four regions during 1996–1999.

Chart 5–6: Racial Disparity in Cancer Pain

Management—Many cancer patients did not receive adequate pain management in two studies during the last decade. Minorities were more likely than nonminorities to have inadequate pain management.

Chart 5–7: Effect of Race/Ethnicity and Language on Parents’ Assessments of Pediatric Care in Medicaid

Health Plans—Minority parents in six states rated certain aspects of their children’s health care lower than white parents during 1997–1998. Language barriers were a major factor in racial/ethnic disparities for Asian and Hispanic groups.

Disparities: Staying Healthy

Racial/Ethnic Disparity in Preventive Care

Why is this important? Long-standing disparities in rates of preventive care for minorities have narrowed for some services, such as screening mammography, but not for others (Breen et al. 2001). This chart provides a snapshot of national disparities in three preventive measures at a fairly recent point in time.

Findings: Blacks and Hispanics were less likely than whites to receive some preventive care services during 1998–1999.

- Mammography rates: African-American women have achieved parity with white women, but Hispanic women still lag behind both groups slightly, by 3 percentage points.
- Smoking cessation counseling: African-Americans lag behind whites by 4 percentage points, while Hispanics trail whites by 13 percentage points.
- Flu shots for older adults: compared to whites, the vaccination rate for African-Americans was 18 percentage points lower, while the rate for Hispanics was 13 percentage points lower.

Source: Community Tracking Study Household Survey (Hargraves 2001).

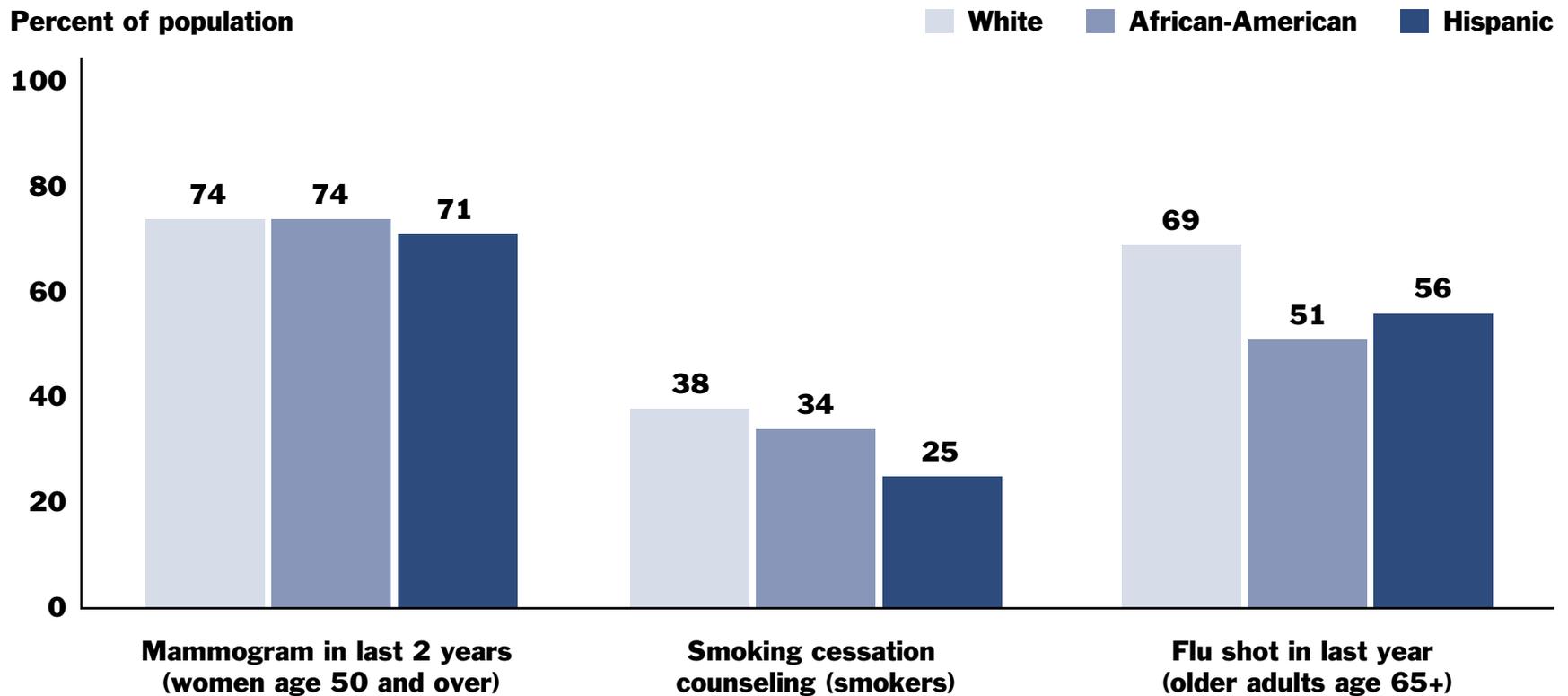
Implications: Disparities in rates of influenza vaccination are most striking, since Medicare covers this preventive service equally for all elderly beneficiaries—indicating that insurance coverage alone is not enough to ensure equality in access. While language barriers appear to be the major cause of disparity among Spanish-speaking Hispanics, a better understanding is needed of the causes of racial disparity in influenza vaccination (Fiscella et al. 2002). Research on mammography suggests that helping people overcome access barriers—in combination with patient or physician reminders—is the most effective way to increase preventive care among groups for which it has been historically low (Legler et al. 2002).



Chart 5-1

Racial/Ethnic Disparity in Preventive Care

Hispanics and African-Americans were less likely than whites to get smoking cessation counseling and flu shots during 1998–1999. Hispanic women were slightly less likely to get a mammogram than white and African-American women.



Source: Adapted with permission from the Center for Studying Health System Change, Community Tracking Study Household Survey (Hargraves 2001).

Disparities: Living with Chronic Illness

Racial Disparity in Lung Cancer Surgery and Survival

Why is this important? Lung cancer is the leading cause of cancer deaths, taking 150,000 lives each year. About one-third of those with the most common form of lung cancer receive their diagnosis at an early, treatable stage of disease. Surgery is the optimal treatment strategy for such patients, resulting in a 40 percent chance of surviving five years or more. Those with more advanced cancers or who do not undergo surgery typically survive less than one year (Bach et al. 1999).

Findings: Among elderly Medicare patients diagnosed with an early stage, treatable form of lung cancer, the rate of surgery was about 13 percentage points lower for blacks than whites.

- Black patients overall experienced worse survival outcomes, about 8 percentage points lower than whites. Most of this difference was due to a lower rate of surgery among blacks.
- Black patients and white patients who underwent surgery had similar survival outcomes. Survival outcomes were similarly low for both blacks and whites who did not undergo surgery.

Source: Linked Medicare–SEER tumor registry data for 10 areas between 1985–1993 (Bach et al. 1999).

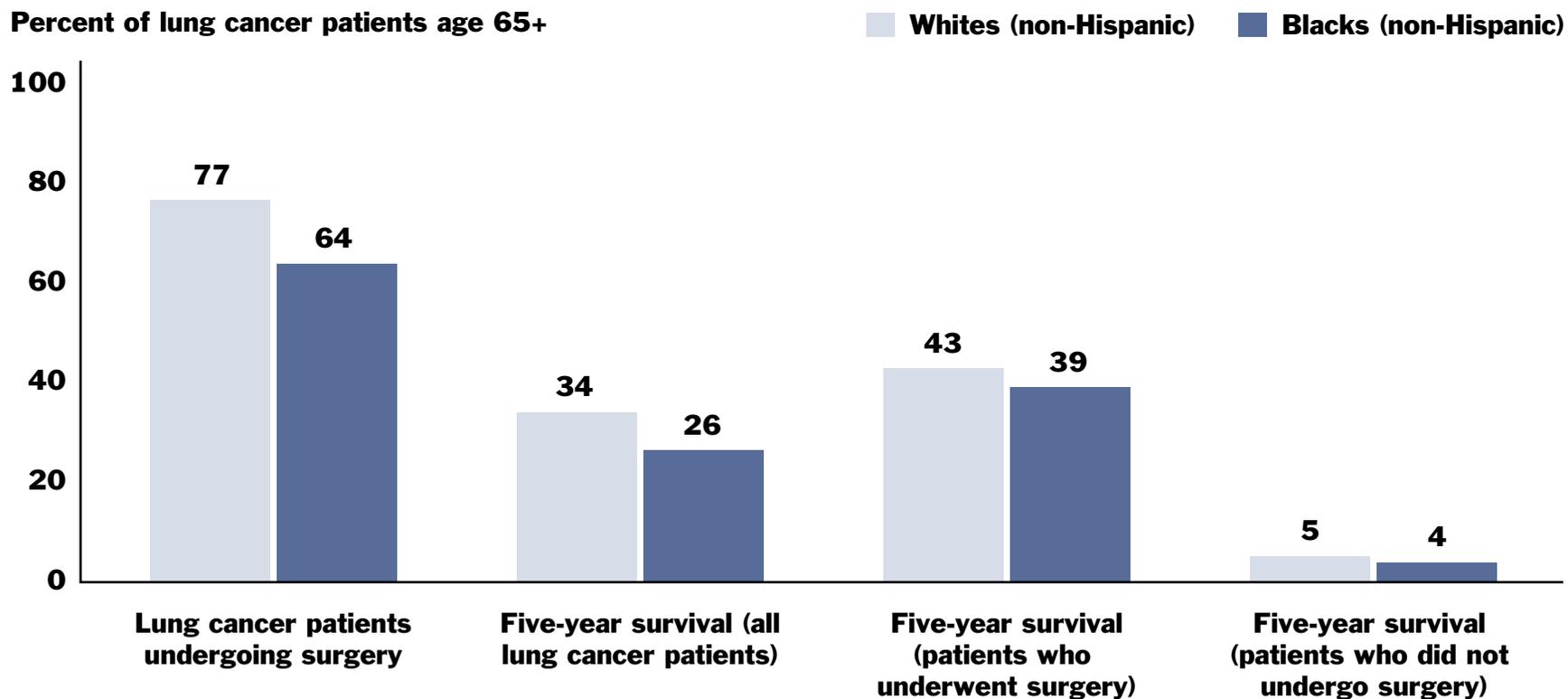
Implications: The lower rate of surgery among older black lung cancer patients is linked to more deaths. To illustrate the effects of this difference, in a group of 1,000 white patients and 1,000 black patients, 77 fewer blacks would survive after five years, and 44 of these 77 deaths would be due to the lower rate of surgery among blacks (Bach et al. 1999). This disparity is striking considering that an effective treatment strategy for early-stage lung disease is clearly known and all these patients had Medicare coverage. Efforts should be directed to discovering the reasons for lower rates of surgery among blacks and taking corrective action.



Chart 5-2

Racial Disparity in Lung Cancer Surgery and Survival

Among Medicare patients diagnosed with an early-stage, treatable form of lung cancer in 10 cancer registry areas during 1985–1993, blacks had worse survival outcomes than whites, mainly due to a lower rate of surgery.



Source: Medicare and SEER data (Bach et al. 1999).

Disparities: Living with Chronic Illness

Racial Disparity in Use of Invasive Heart Procedures

Why is this important? Revascularization procedures—including angioplasty and heart bypass surgery—represent sophisticated medical technologies that are done to restore blood flow when the arteries that supply blood to the heart muscle have become clogged. Racial differences in the use of these invasive procedures have been found in many studies, but often without concluding whether the procedures are overused in whites or underused in blacks. This study represents one of the strongest done to date to answer that question.

Findings: In this study, all patients had undergone diagnostic testing at a single teaching hospital to determine the severity of their heart disease and the need for revascularization. Subsequently, blacks were only marginally less likely than whites to undergo angioplasty, but blacks were 32 percent less likely to undergo bypass surgery and 35 percent less likely to get either type of revascularization procedure, after taking into account the severity of disease and other clinical and access factors. Furthermore, the racial disparity in bypass surgery was greatest among those with more severe disease, who would have benefited most from surgery. As a result, blacks were 18 percent more likely to die than whites over five years of follow-up. Differences in patients' insurance coverage status were not found to determine differences in treatment. Source: Peterson et al. 1997.

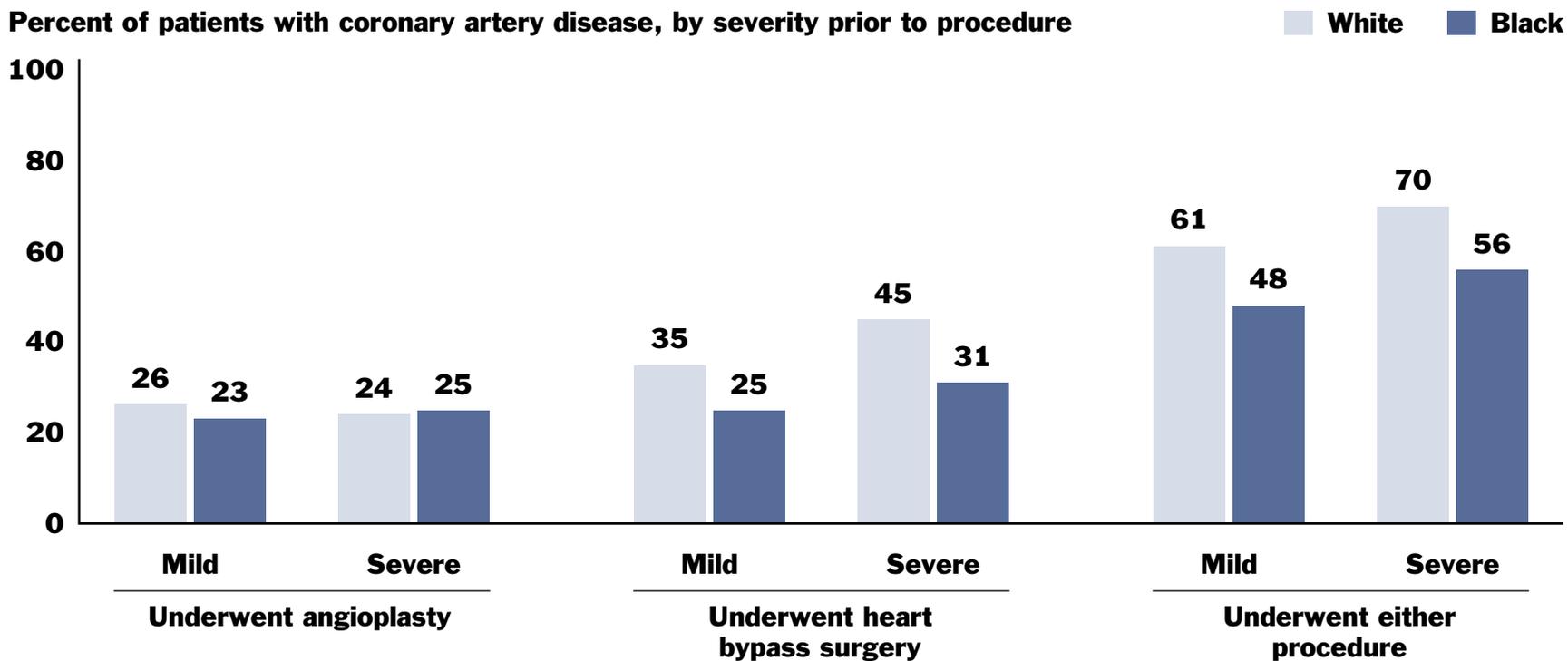
Implications: Revascularization procedures were underused among black patients represented in this study. In a review of similar clinical studies conducted at other institutions and in other states, 17 of 25 found that blacks had a lower likelihood of receiving some procedures than whites. In particular, blacks were 13 percent to 80 percent less likely to receive angioplasty, and 32 percent to 78 percent less likely to receive heart bypass surgery (Kressin and Petersen 2001). These disparities held even after controlling for differences in patient characteristics and access to specialty care. Actions must be directed to understanding and ameliorating the causes of these disparities.



Chart 5-3

Racial Disparity in Use of Invasive Heart Procedures

Black patients with coronary artery disease were less likely than white patients to receive procedures that restore blood flow to the heart muscle, regardless of disease severity, at one teaching hospital from 1984 to 1992. Black patients also had a lower survival rate, indicating that they were undertreated.



Source: Adapted with permission from Peterson et al. 1997. Copyright © 1997 Massachusetts Medical Society. All rights reserved.

Disparities: Living with Chronic Illness

Gender Disparity in Heart Attack Treatment

Why is this important? Several studies have reported that women receive less aggressive hospital-based treatment for heart attack as compared to men. This finding is disturbing, since research shows that such treatment is just as beneficial for women as men (Gan et al. 2000).

Findings: Among Medicare patients hospitalized for heart attack who were ideally suited to receive recommended medications, women as compared to men were:

- three percent less likely to receive thrombolytic therapy and, among those who did receive it, 7 percent less likely to receive it within one hour after arriving at the hospital (thrombolytic therapy dissolves clots that block blood supply to the heart and is most beneficial when given quickly after a heart attack),
- four percent less likely to get aspirin within 24 hours of hospital arrival, and 5 percent less likely to receive aspirin at hospital discharge (aspirin helps prevent dangerous blood clots from forming),
- equally likely to receive a beta-blocker prescription at hospital discharge (beta-blockers help the heart work better by decreasing its need for blood and oxygen; data not shown), and
- five percent more likely to receive an ACE inhibitor prescription at hospital discharge (ACE inhibitors lower blood pressure and increase the supply of blood and oxygen to the heart).

Women and men had similar 30-day adjusted death rates; long-term outcomes were not measured. Source: Medicare Cooperative Cardiovascular Project: 1994–1995 (Gan et al. 2000).

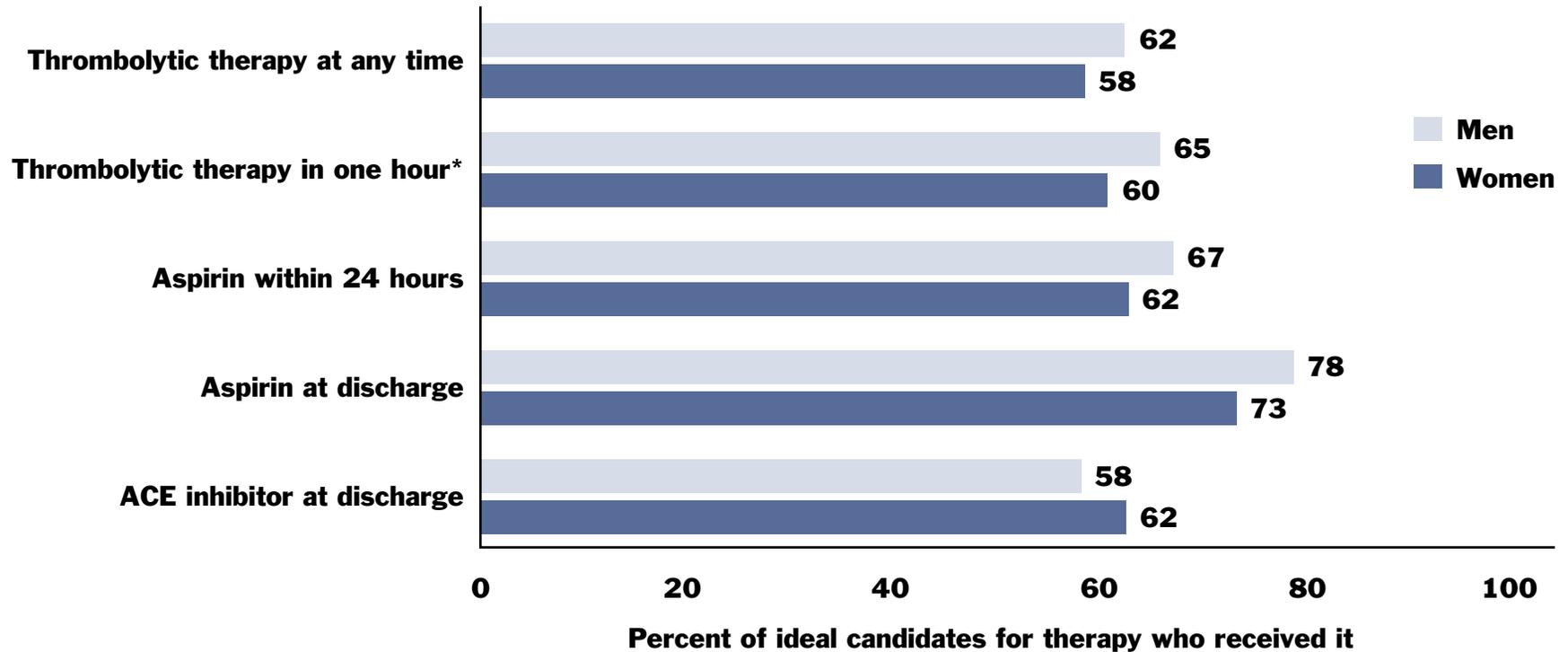
Implications: Women would benefit from more aggressive heart attack treatment where there is clear evidence that certain effective drug therapies are being underused or not provided in a timely manner.



Chart 5-4

Gender Disparity in Heart Attack Treatment

Among Medicare patients hospitalized for heart attack during 1994–1995 who were ideal candidates for drug therapies that are known to be effective in improving survival, women were somewhat less likely than men to receive most drug therapies and were less likely to receive time-sensitive therapies on a timely basis.



Source: Medicare Cooperative Cardiovascular Project (Gan et al. 2000). *Among patients who received any thrombolytic therapy.

Disparities: Living with Chronic Illness

Racial Disparity in Access to Kidney Transplants

Why is this important? More than 88,000 Americans began treatment for kidney failure (end-stage renal disease or ESRD) and 13,483 received a kidney transplant in 1999 (USRDS 2001). Patients who receive a kidney transplant have a longer life expectancy, better quality of life, and lower costs than those who remain on lifelong kidney dialysis (Ayanian et al. 1999).

Findings: Almost all ESRD patients have Medicare coverage, which should minimize disparity in financial access to care. Yet among ESRD patients age 18 to 54 who started kidney dialysis:

- Blacks were less likely than whites to be referred for evaluation and to receive a transplant among those patients who were clinically appropriate candidates. In contrast, among patients for whom transplantation was inappropriate, whites were more likely than blacks to be referred for evaluation and to receive a transplant.
- Blacks were somewhat less likely to desire a transplant, but differences in patient preferences accounted for very little of the overall disparity. Even among those who wanted a transplant, blacks were still less likely than whites to be placed on a waiting list or get a transplant.

Source: Medical records and patient surveys for ESRD patients in four regions who started dialysis during 1996–1997 (Epstein et al. 2000; Ayanian et al. 1999).

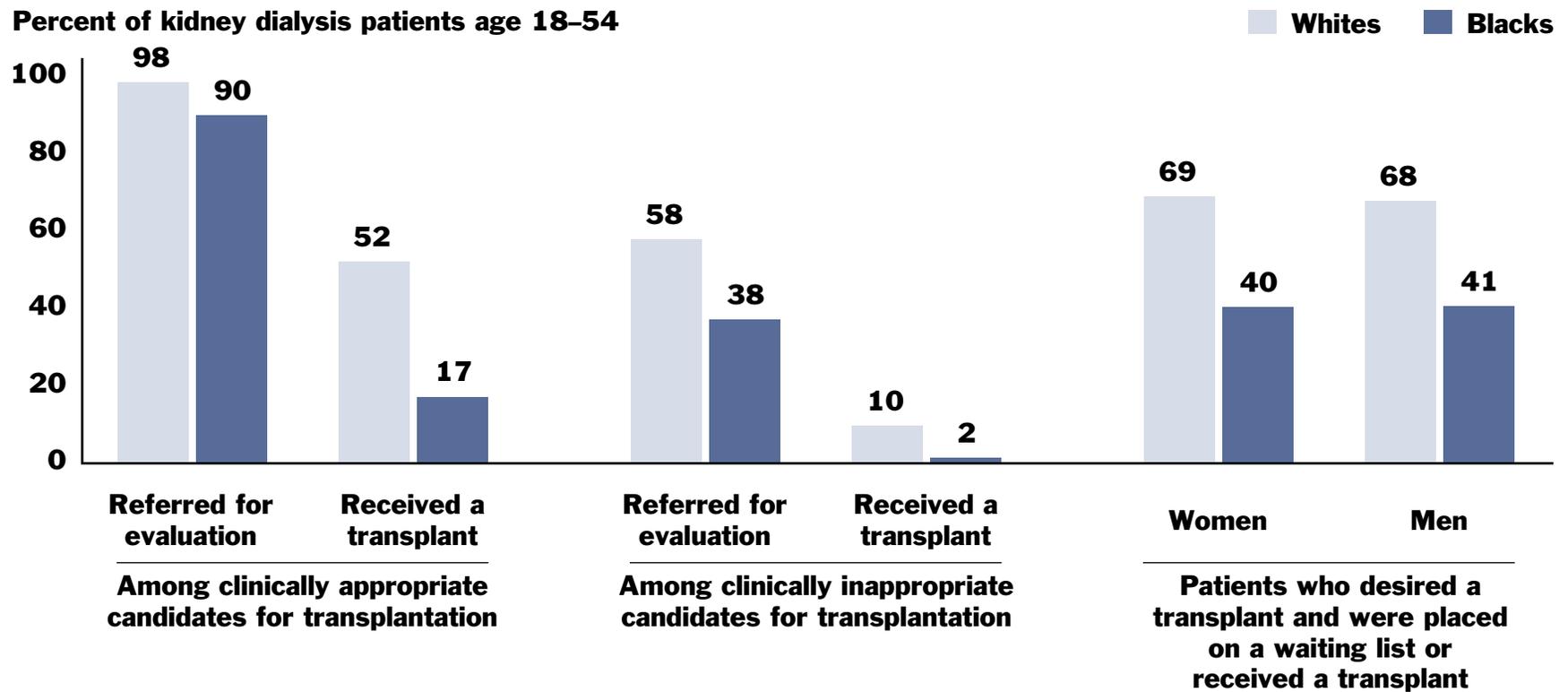
Implications: Kidney transplants were overused when inappropriate mainly among white patients, a troubling finding considering the scarcity of human organs for transplantation. Kidney transplants were underused relatively more often among black patients who would benefit from—and who desired—transplantation. Some of the difference in transplant rates was due to immunologic matching criteria at the time of the study, which have since been relaxed allowing more blacks to obtain transplants (Epstein et al. 2000).



Chart 5-5

Racial Disparity in Access to Kidney Transplants

White patients were more likely than black patients to be referred for and receive a kidney transplant, regardless of clinical appropriateness or patient preferences, among kidney dialysis patients in four regions during 1996–1999.



Source: Clinical data and patient interviews (Ayanian et al. 1999; Epstein et al. 2000).

Disparities: Living with Chronic Illness

Racial Disparity in Cancer Pain Management

Why is this important? Pain is the most persistent and troubling symptom of cancer, often appearing long before cancer reaches the terminal phase. Cancer-related pain can be severe enough to restrict the individual's daily functioning and quality-of-life, even when treated appropriately (Cleeland et al. 1994).

Findings: Many physicians are very conservative in their approach to pain management, with the result that cancer pain is often inadequately managed (Cleeland et al. 1994).

- Among elderly nursing home residents who had cancer and reported being in daily pain, 34 percent of African-Americans and 25 percent of white residents did not receive any pain medication. Source: Nursing home resident assessments in five states for 1992–1995 (Bernabei et al. 1998).
- Among cancer patients visiting 54 outpatient clinics, 59 percent of minority patients and 38 percent of white patients had inadequate pain management based on an assessment of their pain severity and the medication prescribed to treat it (if any). Source: Eastern Cooperative Oncology Group study during 1990–1991 (Cleeland et al. 1994).

Implications: The overall level of inadequate pain management among cancer patients is troubling, while the greater inadequacy among minorities is even more disturbing. Action is needed to address this indicator of poor quality care. Achieving more appropriate pain management will require improving knowledge and acceptance of aggressive pain management guidelines among physicians who treat the elderly as well as overcoming barriers such as inadequate nursing home staffing (Bernabei et al. 1998).

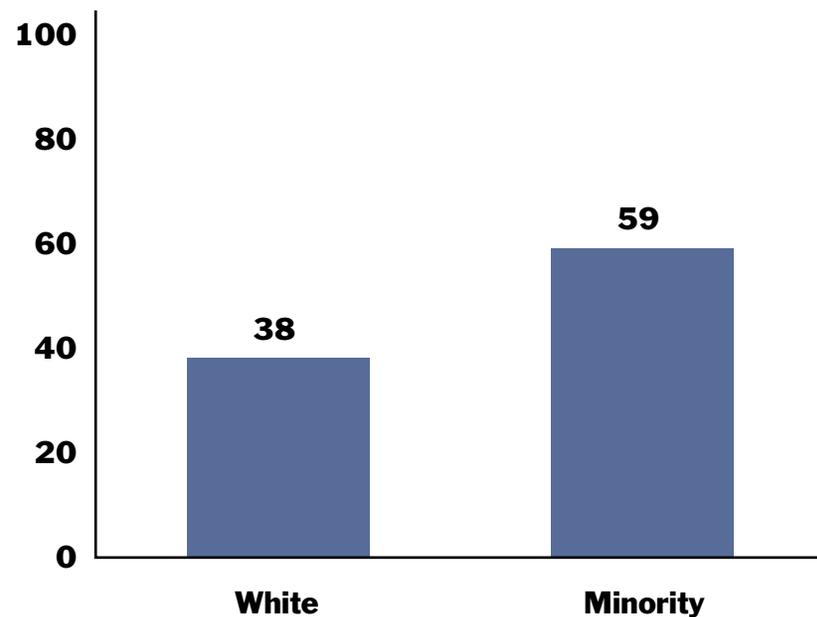


Chart 5-6

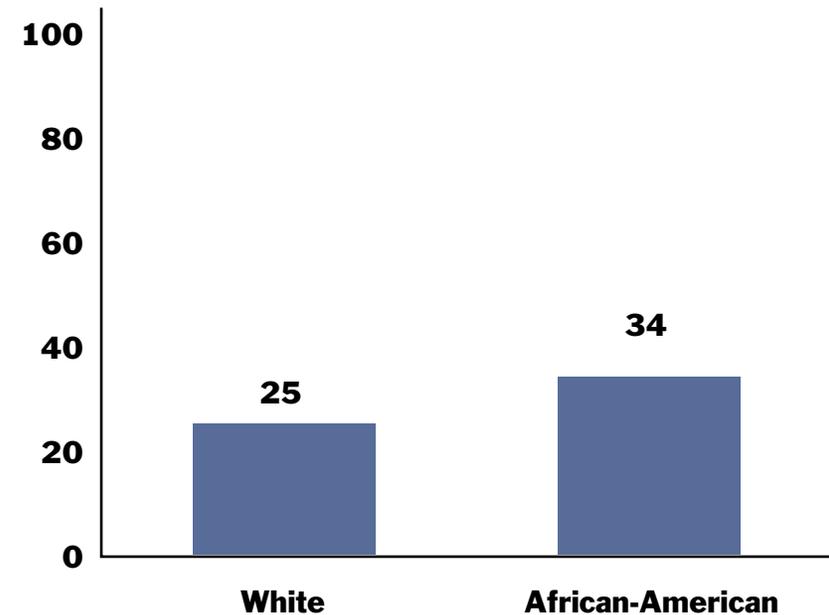
Racial Disparity in Cancer Pain Management

Many cancer patients did not receive adequate pain management in two studies during the last decade. Minority patients were more likely than white patients to have inadequate pain management.

Percent of cancer patients visiting outpatient clinics who had inadequate pain management (1990–1991)



Percent of elderly nursing home residents with cancer who were in daily pain and did not receive any pain medications (1992–1995)



Sources: Eastern Cooperative Oncology Group (Cleeland et al. 1994). Systematic Assessment of Geriatric drug use via Epidemiology (SAGE) database (Bernabei et al. 1998). Results from the two studies are not directly comparable due to differences in methods.

Disparities: Patient Experience

Effect of Race/Ethnicity and Language on Parents' Assessments of Pediatric Care in Medicaid Health Plans

Why is this important? Racial and ethnic minorities have unique needs and expectations that may affect their experience with and ratings of health care. People over the age of five who speak a language other than English at home now number 44 million or 16 percent of the U.S. population (KFF 2001). People who are not proficient or have limited proficiency in English are less likely to receive information about their therapy, understand medication instructions, receive preventive services, seek medical care, and keep follow-up appointments after an encounter involving another language (KFF 2001).

Findings: Minority parents generally rated certain aspects of their children's health care lower than white parents. Among Asian and Hispanic parents, those who did not speak English as their primary language gave significantly worse ratings than English speakers; there was no statistically significant difference in ratings between whites and English-speaking Hispanics and Asians. Source: Consumer Assessment of Health Plans surveys for Medicaid beneficiaries in six states during 1997–1998 (Weech-Maldonado et al. 2001). See Charts 4–4 and 4–5 for the specific aspects of care measured by these domains.

Implications: Racial and ethnic minorities face disparities in their experience of health care, even when they are covered equally by the same type of insurance. Language barriers are a major cause of disparity in health care for Hispanics and Asians who are not fluent in English (Flores et al. 1998). Health plans and health care providers must give increased attention to the unique communication needs of racial and ethnic minorities. Policymakers should consider the need to increase the availability of competent interpreter services and bilingual health care providers to improve health care delivery for minorities.

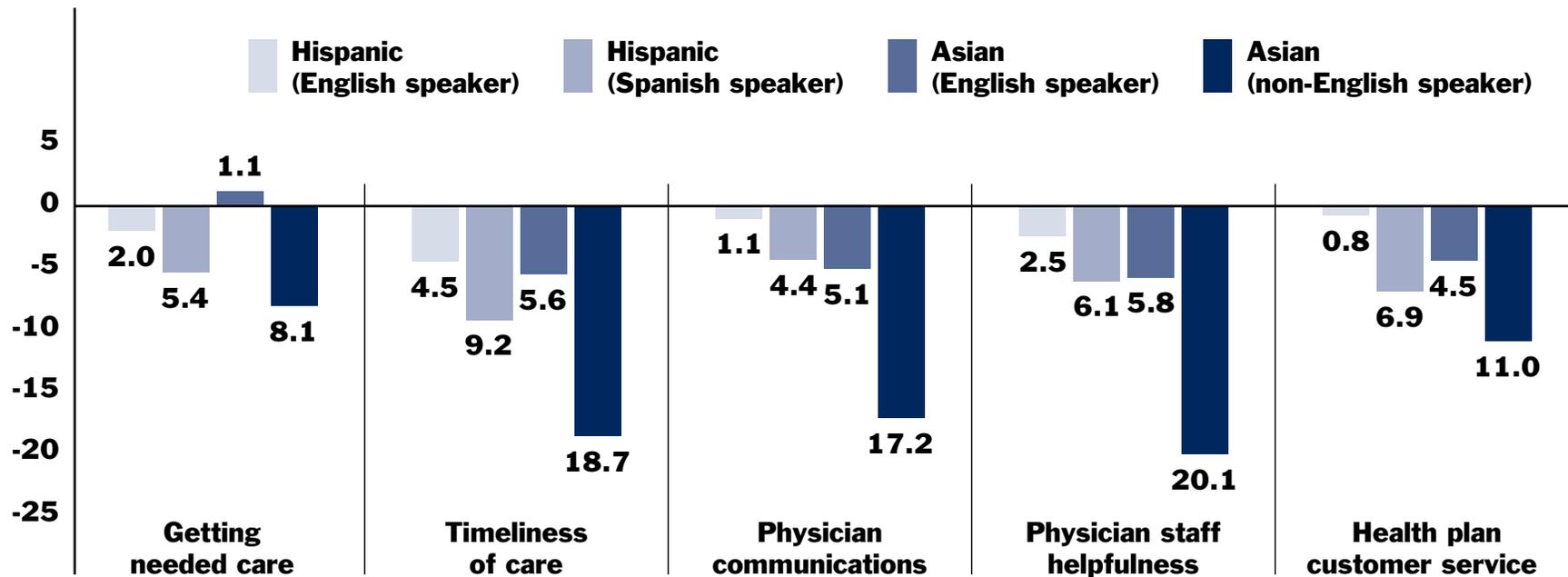


Chart 5-7

Effect of Race/Ethnicity and Language on Parents' Assessments of Pediatric Care in Medicaid Health Plans

Minority parents in six states rated certain aspects of their children's health care lower than white parents during 1997-1998. Language barriers were a major factor in racial/ethnic disparities for Asian and Hispanic groups.

Estimated average difference in rating compared to white parents



Source: Consumer Assessment of Health Plans (Weech-Maldonado et al. 2001).

Chapter 6

Capacity to Improve

Our current methods of organizing and delivering care are unable to meet the expectations of patients and their families because the science and technologies involved in health care . . . have advanced more rapidly than our ability to deliver them safely, effectively, and efficiently. . . . Without substantial changes in the ways health care is delivered, the problems resulting from the growing complexity of health care science and technology are unlikely to abate; in fact, they will increase.

—Institute of Medicine 2001a

Chapter 6

Capacity to Improve: Introduction

The purpose of the health care system is “to continually reduce the burden of illness, injury, and disability, and to improve the health and functioning of the people of the United States” (IOM 2001a). The nation’s effort to achieve this goal through increased funding for biomedical research and development has achieved stunning advances in knowledge and technologies to prolong and enhance the quality of life.

Yet health care delivery has not kept pace with these advances in science and technology or with patient expectations, as the preceding chapters illustrate. These gaps represent a compelling need for quality improvement. For example, widespread adoption of methods to remind physicians when preventive care is due could achieve as great a benefit in terms of lives saved as some advances in treatment (Balas et al. 2000).

Quality can be measured and improved. Quality improvement initiatives provide the information and tools needed by physicians and other health providers to practice in accordance with the current state of medical knowledge. As the Institute of Medicine reported, “no one clinician can retain all the information necessary for sound, evidence-based practice”

(IOM 2001a). Improving performance requires more systematic approaches to evaluate and incorporate evidence into practice, more effective education for patients and practitioners, more rigorous methods of assessment and accountability, and greater teamwork among health care professionals and other stakeholders in the health care system.

To improve the quality of care, physicians need to know what processes of care—such as testing, treating, or educating patients—achieve better or worse health outcomes under given circumstances (Hammermeister et al. 1995). Organizational attributes such as leadership, culture, and information systems are also important factors in determining the success of efforts at improvement (Ferlie and Shortell 2001).

Finally, quality improvement interventions must be rigorously evaluated to determine whether and when they are cost-effective in achieving their aims for improving health outcomes and patient experience with the health system. The charts on the following pages illustrate interventions that have been evaluated on a relatively short-term basis; a critical challenge is to ensure that these gains are sustained over time.

Capacity to Improve: Summary of Charts and Findings

Chart 6–1: Improving Immunization Rates—Patients who received reminders about upcoming or overdue immunizations were two-and-a-half times more likely to be vaccinated or up-to-date on vaccinations than those who did not receive reminders.

Chart 6–2: Reducing Unnecessary Antibiotic Use—A multi-faceted educational intervention aimed at both patients and physicians, along with performance feedback for physicians, safely reduced antibiotic prescribing by over one-third among patients with uncomplicated bronchitis at one health plan.

Chart 6–3: Improving Diabetes Management—Process and outcomes of care improved among Medicare patients with diabetes after six health plans collaborated for performance monitoring and implementing plan-specific interventions.

Chart 6–4: Improving Medical Treatment for Heart Attack—Medical treatment of heart attack improved after Medicare Peer Review Organizations in four states provided performance feedback to physicians and encouraged them to make practice improvements.

Chart 6–5: Improving Outcomes of Heart Bypass Surgery—Bypass surgery death rates declined nearly one-quarter at five Northern New England hospitals collaborating in a quality improvement intervention.

Chart 6–6: Improving Treatment and Outcomes for Depression—Improving opportunities for appropriate depression treatment had a positive affect on the quality and outcomes of depression care in primary care clinics.

Chart 6–7: Reducing Pressure Ulcers in the Nursing Home—The development of new bed sores declined 30 percent over four years in a national nursing home chain.

Chart 6–8: Preventing Medication Mistakes—Over 80 percent of medication mistakes were prevented through the use of a computerized physician order-entry system, leading to a reduction in preventable adverse drug events (patient injuries).

Capacity to Improve: Staying Healthy

Improving Immunization Rates

Why is this important? Many patients or parents cannot remember the recommended immunization schedule for childhood or adult vaccination. Patient reminder systems are recommended by expert bodies including the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices. Yet, only 21 percent to 35 percent of pediatricians and family physicians reported using patient reminder systems (CDC 1998b; Schaffer et al. 2001).

Findings: Thirty-three (80%) of 41 controlled studies conducted over the past three decades found that reminding patients about immunizations improved vaccination rates among children and adults. Source: Cochrane systematic review (Szilagyi et al. 2000).

- Overall, patients who received reminders about upcoming or overdue immunizations were two-and-a-half times more likely to be vaccinated or up-to-date on their vaccinations than those who did not receive reminders. Many types of reminders were effective, including postcards, letters, and telephone—which was the most effective but costliest method.
- Among children, routine immunization rates increased 16 percentage points at the median (middle of the range), while influenza vaccination rates increased 25 percentage points.
- Among adults, influenza vaccination rates increased 7 percentage points at the median (middle of the range), while pneumococcal and tetanus vaccination rates increased 11 percentage points.

Implications: Patient reminder systems are highly effective. Although the costs of implementing such systems can range from \$7 to \$63 per child vaccinated, advances in automated billing systems and immunization registries are making reminder systems increasingly affordable for more physicians (Szilagyi et al. 2000).

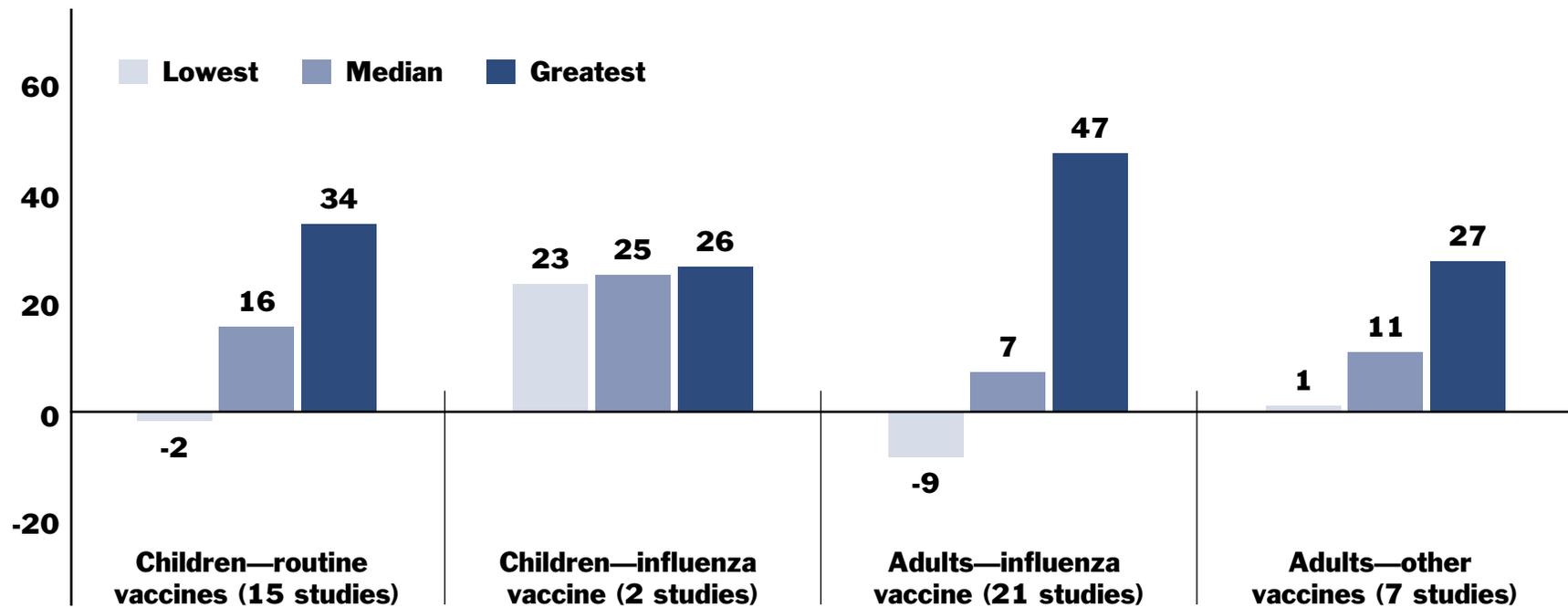


Chart 6-1

Improving Immunization Rates

A synthesis of controlled studies found that patients who received reminders (such as postcards, letters, or phone calls) about upcoming or overdue immunizations were two-and-a-half times more likely to be vaccinated or up-to-date on their vaccinations than those who did not receive such reminders.

Percentage point change (increase or decrease) in immunization rate for reminders compared to control group



Source: Szilagyi et al. 2000.

Capacity to Improve: Getting Better When Sick

Reducing Unnecessary Antibiotic Use

Why is this important? To curb the spread of antibiotic-resistant pathogens, the widespread overuse of antibiotics must be reduced. In response to patient expectations, however, physicians continue to prescribe antibiotics in up to half of patient visits for colds and other upper respiratory infections and up to four-fifths of office visits for bronchitis. Since most of these illnesses are caused by a virus, such prescribing is often not indicated or effective (Gonzales et al. 1999).

Findings: A combination of patient education materials mailed to patients' homes and displayed at physician offices as well as professional education and performance feedback for physicians was successful in safely reducing antibiotic prescribing by over one-third among adult patients with uncomplicated bronchitis who visited clinics affiliated with one health plan during 1997–1998.*

Reduced antibiotic use did not lead to more return office visits for bronchitis or pneumonia, increased use of non-antibiotic prescription treatments compared to the control group, or reduced patient satisfaction. Sources: Gonazales et al. 1999; Gonzales et al. 2001.

Implications: A multi-faceted educational intervention for both patients and physicians, combined with performance feedback for physicians, was successful in safely reducing the overuse of antibiotics.

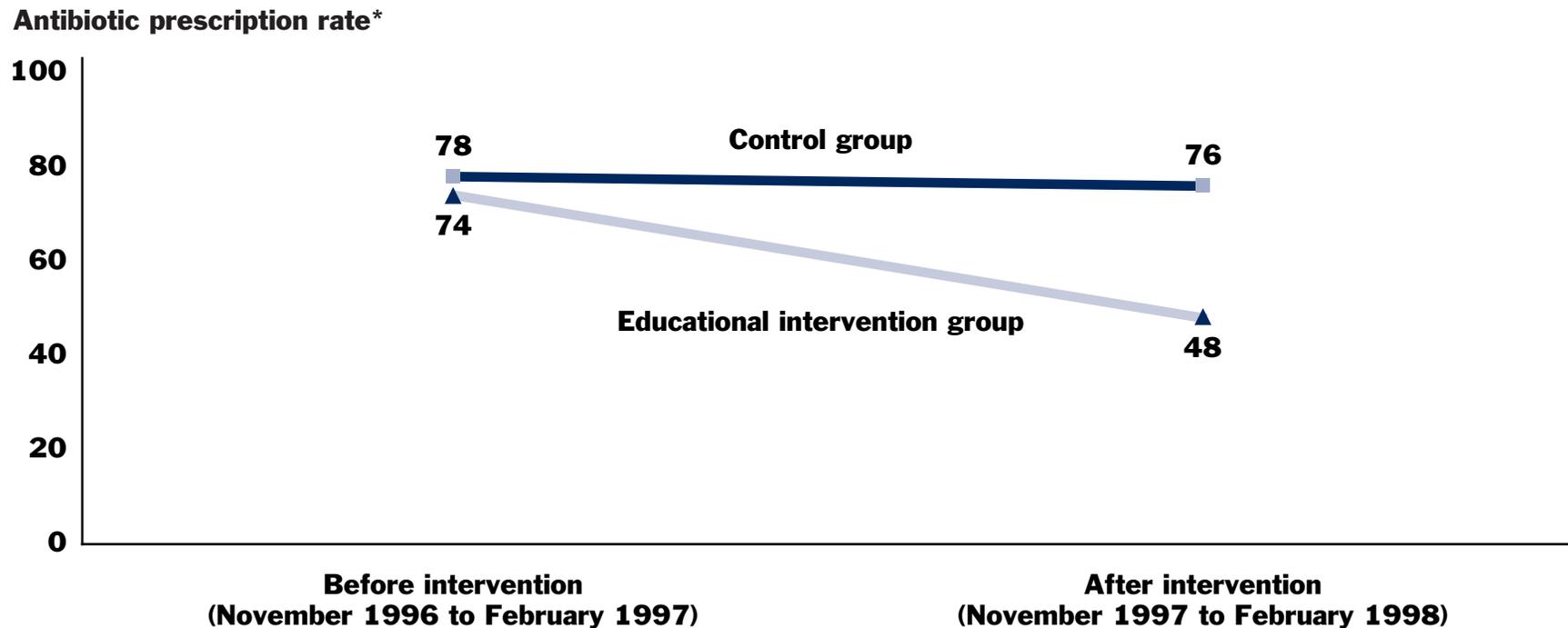
* There was no significant difference in antibiotic prescribing for a limited intervention involving only education in physician offices, so results for this group have not been shown for simplicity.



Chart 6-2

Reducing Unnecessary Antibiotic Use

A multi-faceted educational intervention aimed at both patients and physicians, along with performance feedback for physicians, safely reduced antibiotic prescribing by over one-third among patients with uncomplicated bronchitis at a Colorado health plan.



Source: Adapted with permission from Gonzales et al. 1999. Copyrighted 1999, American Medical Association. Results for a limited intervention group are not shown. *Percent of office visits by adults diagnosed with uncomplicated bronchitis at which antibiotic was prescribed.

Capacity to Improve: Living with Chronic Illness

Improving Diabetes Management

Why is this important? Care for diabetes requires regular follow-up, education, and monitoring. Since the average physician participates with multiple health plans and patients often move from plan to plan, improvements in diabetes management may require collaborative effort between public health organizations, health plans, and physicians.

Findings: The quality of diabetes care among Medicare patients improved when six managed health care plans in Arizona collaborated with the state's Medicare Peer Review Organization (PRO) on a quality improvement initiative. After one year:

- A greater proportion of patients received all needed services including diabetes monitoring, education, and follow-up treatment (34 percent before vs. 55 percent after the intervention).
- The proportion of patients with their blood sugar under control (glycosylated hemoglobin A1c below 8 percent) rose from 40 percent of patients prior to 62 percent after the intervention.

The PRO measured and provided comparative feedback on health plan performance at the beginning of the project and one year later. Each health plan designed its own intervention, which included case management, physician-developed tracking forms, medical record reminder systems, data feedback for individual physicians, and patient education. Source: Marshall, Bluestein, Briere, et al. 2000.

Implications: This experience demonstrates the feasibility of collaboration among competing health care organizations to improve the management of diabetes care by primary care physicians through case management, tracking and reminders systems, performance feedback, and patient education.

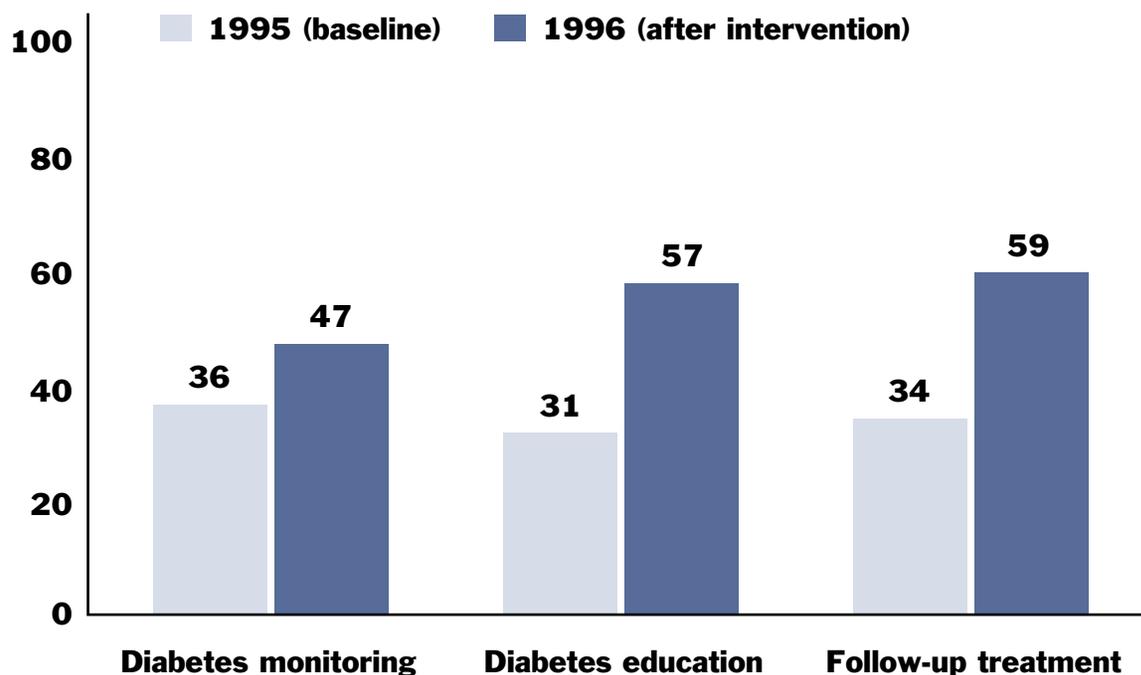


Chart 6-3

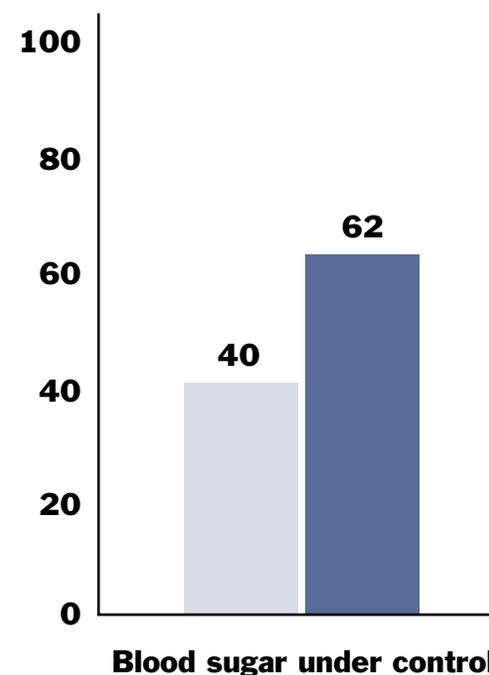
Improving Diabetes Management

Care of diabetes requires regular follow-up, education, and monitoring. Process and outcomes of care improved among Medicare patients with diabetes after six competing Arizona Medicare health plans collaborated for performance monitoring and implementing plan-specific interventions.

Percent of needed services provided to diabetes patients



Percent of diabetes patients



Source: Marshall, Bluestein, Briere, et al. 2000.

Capacity to Improve: Living with Chronic Illness

Improving Medical Treatment for Heart Attack

Why is this important? Certain medications—aspirin, beta-blockers, and angiotensin-converting enzyme (ACE) inhibitors, when indicated—significantly reduce the recurrence of heart attack and improve patients' survival when prescribed during hospitalization and afterwards as long-term preventive therapy for heart attack victims. Many patients, however, do not get the medications.

Findings: Medical treatment of heart attacks improved after Medicare Peer Review Organizations in four states provided performance feedback to physicians and encouraged them to make improvements. Source: Cooperative Cardiovascular Project (Marciniak et al 1998). Among Medicare patients who were ideal candidates for drug therapy:

- Aspirin use increased by 7 percentage points during hospitalization and by 10 percentage points at hospital discharge (aspirin helps prevent dangerous blood clots from forming).
- Beta-blocker and ACE inhibitor prescriptions at discharge increased by 20 percentage points and 14 percentage points, respectively (beta-blockers help the heart work better by decreasing its need for blood and oxygen; ACE inhibitors lower blood pressure and increase the supply of blood and oxygen to the heart).
- There was a 10 percent relative reduction in death rates measured at 30 days and one year after hospitalization, to a level slightly better than the rest of the nation.

Implications: A quality improvement initiative that includes collaborative sharing of performance data can have a measurable impact on improving quality-of-care and health outcomes, including reduced mortality.

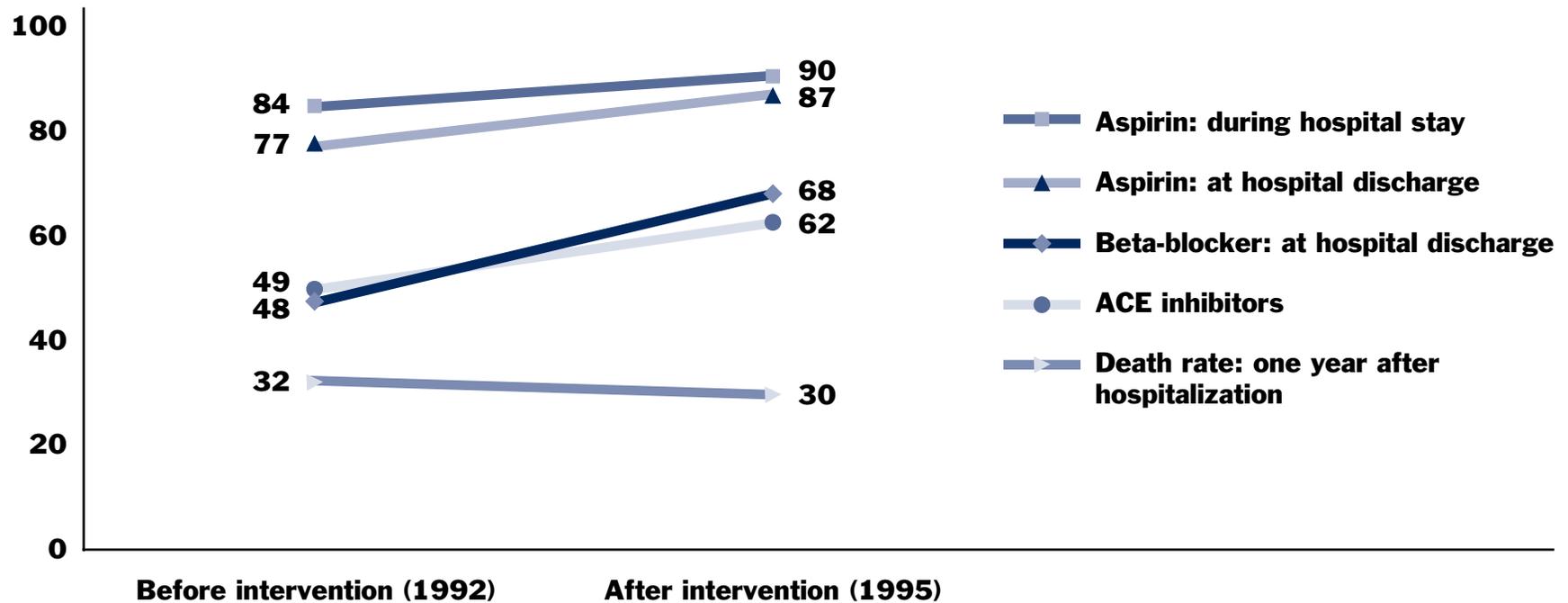


Chart 6-4

Improving Medical Treatment for Heart Attack

Medical treatment of heart attack improved after Medicare Peer Review Organizations in four states provided performance feedback to physicians and encouraged them to make practice improvements, which most likely contributed to improved survival outcomes.

Percent of Medicare patients who were ideal candidates for therapy



Source: Medicare Cooperative Cardiovascular Project (Marcianiak et al. 1998).

Capacity to Improve: Living with Chronic Illness

Improving Outcomes of Heart Bypass Surgery

Why is this important? Heart bypass surgery—one of the most frequently performed surgical procedures—has received much attention in quality improvement efforts. One of the most rigorous is the Northern New England Cardiovascular Disease Study Group, a voluntary consortium of hospitals founded in 1987. By collecting detailed clinical data over time, the group discovered wide variation in bypass surgery death rates—ranging from 2 percent to 10 percent among surgeons. In response, the consortium implemented a cooperative quality improvement intervention.

Findings: After Northern New England hospitals and surgeons implemented a cooperative quality improvement intervention, the regional in-hospital bypass surgery death rate fell to a level 24 percent lower than expected based on historical regional data (3.3% vs. 4.3%)—resulting in 74 fewer deaths from 1991 to 1993 (the time period measured in a post-intervention study).

The intervention consisted of: (1) regular confidential feedback of outcomes data to each surgeon and hospital in the region, (2) training in quality improvement techniques, and (3) a series of site visits to discover best practices at each institution. As a result of these efforts, numerous changes were initiated at each hospital based on a better understanding about the relationship between processes and outcomes of care. Source: O'Connor et al. 1996; Wennberg and Cooper 1999.

Implications: Rigorous methods of peer review and benchmarking such as these are still relatively rare in the U.S. Their success urges that policymakers—public and private—examine the feasibility of adopting similar methods elsewhere.

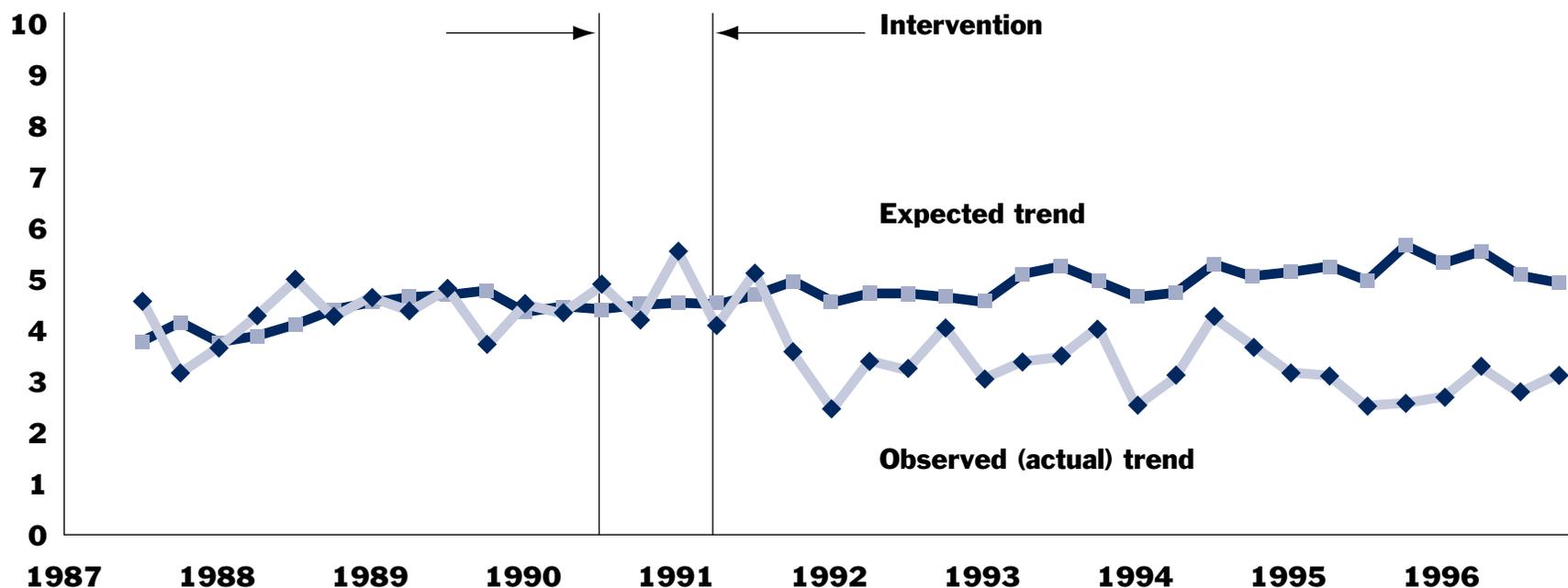


Chart 6-5

Improving Outcomes of Heart Bypass Surgery

The regional actual bypass surgery death rate fell to a level 24 percent lower than expected among patients at five northern New England hospitals collaborating in a quality improvement intervention that included performance feedback, training in quality improvement, and benchmarking activities.

Regional in-hospital death rate (percent of patients undergoing bypass surgery)



Source: Adapted with permission from Wennberg and Cooper 1999, © 1999 Trustees of Dartmouth College; and O'Connor et al. 1999, Copyrighted 1999, American Medical Association.

Capacity to Improve: Living with Chronic Illness

Improving Treatment and Outcomes for Depression

Why is this important? Care for depressive disorder is often not optimal, despite research showing the effectiveness of antidepressant medication and specific psychotherapies. In the past, guidelines and performance feedback have had little effect on improving depression care.

Findings: Short-term interventions designed to improve treatment of patients with depressive symptoms in primary care practices had significant positive effects on quality of care and patient outcomes after one year as compared to patients who received usual care.

- Quality improvement patients were more likely to receive appropriate care (counseling or antidepressant medication at an appropriate dose), to see a mental health specialist, and to get care that matched their preferences. There was no overall increase in medical visits.
- Quality improvement patients were less likely to have probable depressive disorder and were more likely to be employed after one year.

The intervention included: (1) explicit commitment to quality improvement, (2) training local experts to provide education and feedback to clinicians, (3) training local nurses to provide patient assessment and education, and (4) identifying potentially depressed patients. In a Quality Improvement Meds intervention group, local nurses were trained to provide follow-up assessments to support medication adherence. In a Quality Improvement Therapy group, local psychotherapists were trained to provide cognitive behavior therapy, for which health plans reduced their normal patient copayment. Source: Wells et al. 2000; Dwight-Johnson et al. 2001.

Implications: A carefully designed quality improvement program can significantly improve the process and outcomes of depression care. Cost-effectiveness was comparable to other accepted medical interventions (Schoenbaum et al. 2001).

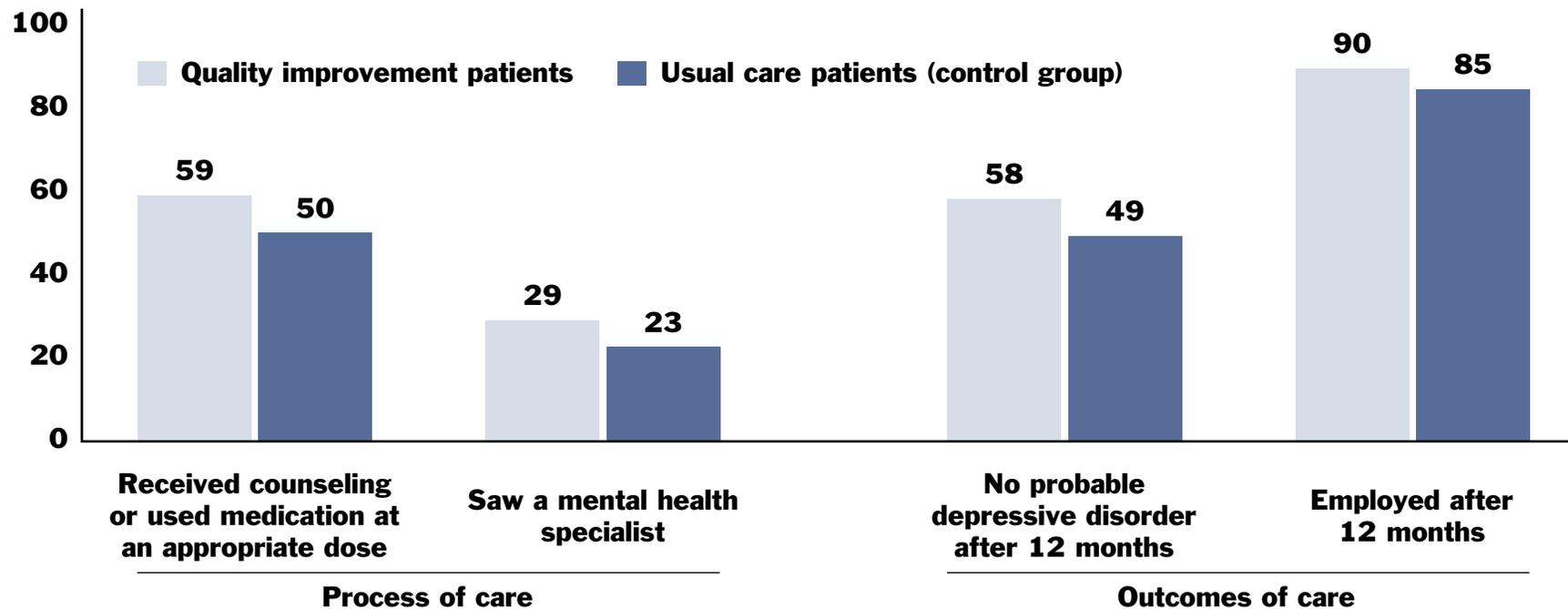


Chart 6-6

Improving Treatment and Outcomes for Depression

Improving opportunities for appropriate depression treatment had a positive affect on the process and outcomes of depression care after one year among patients treated at 46 primary care clinics affiliated with six managed care organizations during 1996–1997.

Percent of adult patients with depression



Source: Partners in Care Study, Wells et al. 2000.

Capacity to Improve: Long-Term Care

Reducing Pressure Ulcers in the Nursing Home

Why is this important? The development of pressure ulcers (bed sores) among nursing home residents is one measure of patient quality-of-life and is closely linked to general quality of care in nursing homes. Pressure sores are often preventable with appropriate interventions such as regular skin assessments, turning schedules, pressure reduction devices, nutritional supplements, dressings, and physician consultation (Mukamel 1997; Berlowitz et al. 1997; Berlowitz et al. 2000).

Findings: The development of new pressure ulcers among residents of one national nursing home chain declined 30 percent (risk-adjusted rate) over a five-year period from 1991 to 1995.

- As a result of this improvement, 127 fewer residents developed a pressure ulcer in six months of the last study year than would have if the rate had remained unchanged at these facilities.
- Reduction in pressure ulcers saved an estimated \$800,000 in treatment costs in just six months among the 107 nursing homes included in the study.

Source: Minimum Data Set (Berlowitz et al. 2000). Risk-adjusted rates accounted for 12 patient characteristics. New pressure ulcers were defined as stage two and above.

Implications: Prevention of pressure ulcers indicates improved patient care within these nursing homes. This improvement may be a result of regular assessment of residents, greater attention to this issue within the medical community and among regulators, implementation of guidelines, and the threat of malpractice suits (Berlowitz et al. 2000).

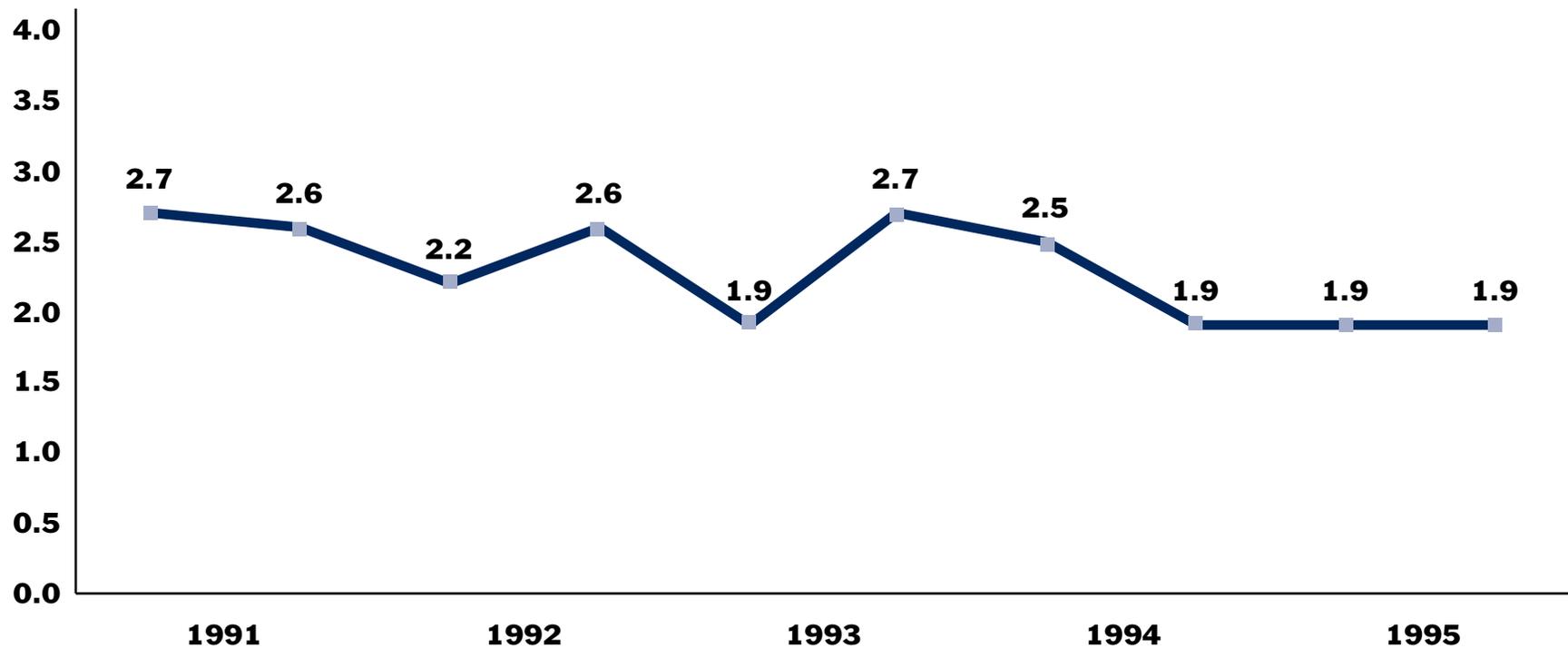


Chart 6-7

Reducing Pressure Ulcers in the Nursing Home

The development of new pressure ulcers (bed sores) declined 30 percent among residents of 107 nursing homes affiliated with a national nursing home chain in nine states, suggesting improved quality of care.

Six-month risk-adjusted rate of pressure ulcer development (percent)



Source: Minimum Data Set (Berlowitz et al. 2000).

Capacity to Improve: Patient Safety

Preventing Medication Mistakes

Why is this important? Medication mistakes are a common occurrence in hospitals. Although most medication errors are not serious, a small percentage result in patient injury while others represent “near misses” that could result in injury under different circumstances.

Findings: Implementation of a computerized physician order entry system in a large Boston teaching hospital reduced the rate of overall medication errors (other than missing doses) by 80 percent when the system was fully developed to detect drug allergies and dangerous drug-drug interactions. Source: Bates et al. 1999.

- Serious medication errors (nonintercepted)—those that actually caused injury or had the potential to cause injury and were not caught before reaching the patient—fell by 86 percent.
- Preventable adverse drug events—injury due to medication mistakes—declined by 62 percent.
- Potential adverse drug events (nonintercepted)—“near misses” that reached the patient but didn’t cause injury by chance—were reduced 100 percent to zero.
- Error reductions occurred at all stages of the medication use process (drug ordering, transcribing, dispensing, and administering).

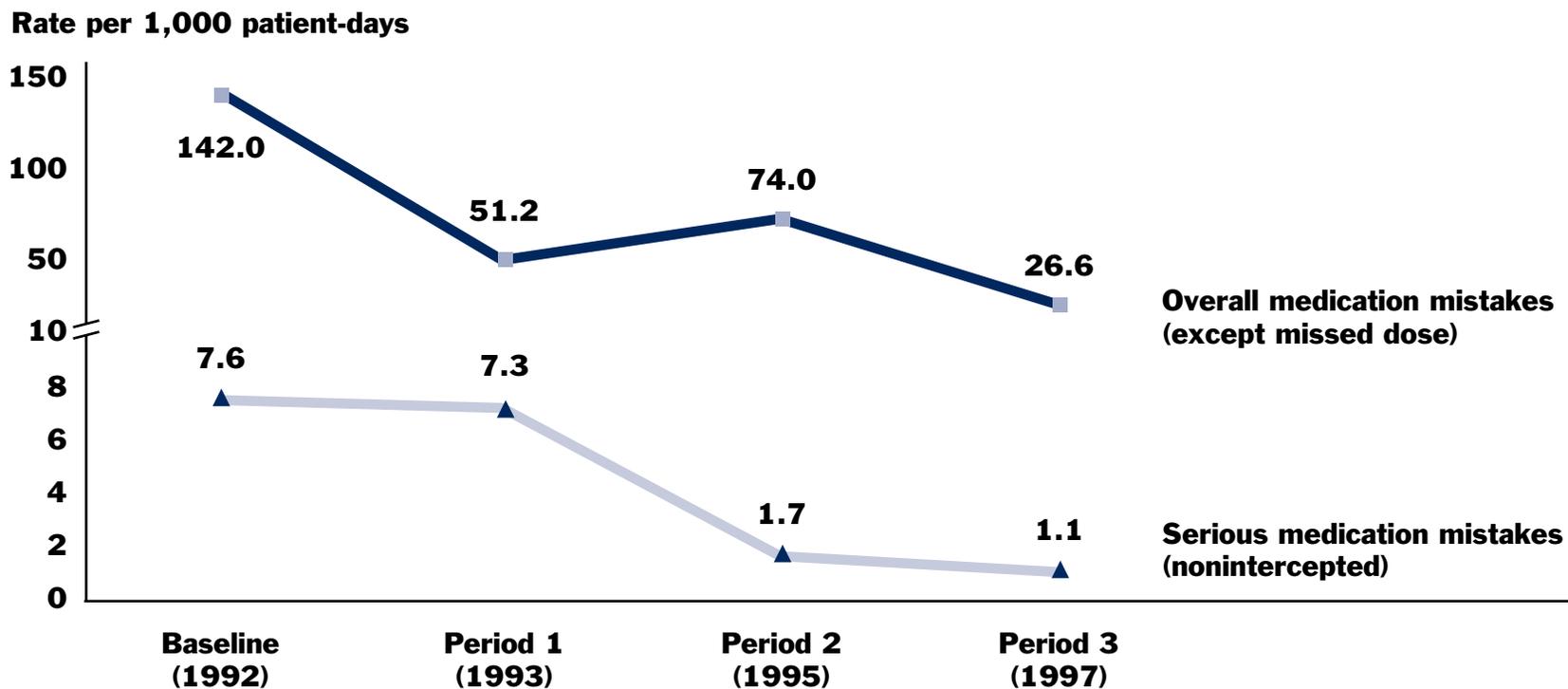
Implications: Computerized physician prescribing in every non-rural hospital in the United States could prevent about 522,000 serious medication errors each year. Over 500 deaths could be prevented each year as a result of hospital-based computerized prescribing if only one-tenth of one percent of such errors resulted in the death of the patient. Currently, only 3 percent of U.S. hospitals have implemented computerized physician prescribing systems (Birkmeyer and Birkmeyer 2000; Leapfrog Group 2002).



Chart 6-8

Preventing Medication Mistakes

Over 80 percent of medication mistakes (other than missed doses) were prevented by a computerized physician order entry system once it was fully developed at a teaching hospital. Medication mistakes that caused patient injury or had the potential to cause injury (and were not intercepted before reaching the patient) were reduced by 86 percent.



Source: Adapted with permission from Bates et al. 1999.

Technical Appendix

This appendix provides more detailed information on data sources and study methodologies. Since the Chartbook presents data from many different kinds of sources and studies conducted by different researchers, methodologies differ from chart to chart. All differences described as statistically significant reflect a 95 confidence level or greater.

Chart 1–1: Childhood Immunizations. The National Immunization Survey (NIS) is an annual, random telephone survey of households with children who are age-eligible for vaccinations (34,087 household interviews were completed in 2000), supplemented by vaccination records obtained from health care providers (for 22,958 children in 2000). The NIS is conducted by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC). Final estimates were weighted to represent all children surveyed and adjusted to account for nonresponding households, households without telephones, and changes in birthrates (Eberhardt et al. 2001; CDC 2001a).

Chart 1–2: Immunizations for Older Adults. The National Health Interview Survey is conducted by the NCHS through personal interviews with a sample of 36,000 to 47,000 households, depending upon the year. Response rates have ranged from 94 to 98 percent on the core survey. Results are weighted to be representative of the entire U.S. civilian, noninstitutionalized population. Respondents who did not know their vaccination status were excluded from the analysis for the years 1995–2001; rates for 1989–1993 would be slightly higher if a similar methodology had been used in those years. For 1997–2001, crude rates shown in the graph did not differ by more than one percentage point from 2000 age-standardized rates (Eberhardt et al. 2001; CDC 1995; 2000a; 2002b; www.cdc.gov).

Chart 1–3: Colorectal Cancer Screening. The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based, random telephone survey of the U.S. civilian, noninstitutionalized adult population (age 18 and older) conducted in cooperation between the CDC and state health departments.

Data for 1999 included 63,555 respondents age 50 and older (median response rate of 57%). Rates were weighted to be representative of each state's adult population and age standardized to the 1999 BRFSS population. Those who didn't respond or didn't know if they had been screened were excluded from the analysis (CDC 2001c). Excluding Puerto Rico from the results did not substantially change the national averages, e.g., for fecal occult blood test in the last year: 20.6 percent with Puerto Rico vs. 20.9 percent without Puerto Rico.

Chart 1–4: Breast Cancer Screening and Outcomes. Mammography data are derived from supplements to the National Health Interview Survey (NHIS; see Chart 1–2 for description) in certain years; response rates were somewhat lower (e.g., 80%) than for the core NHIS survey. The breast cancer death rate was age-standardized to the 2000 population to control for the changing age composition of the population over time; the NCHS obtains data on all deaths recorded by state registration offices (Eberhardt et al. 2001, Table 41; MacKay, Fingerhut, and Duran 2000, Table 82).

Chart 1–5: Smoking Cessation Counseling. The National Ambulatory Medical Care Survey is an annual survey of office-based physicians conducted by the NCHS using a complex sampling design. Participating physicians complete a one-page encounter form after patient visits during a randomly selected week. Physician response rates ranged from 70–73 percent from 1991–1995. Data included 145,716 adult patients visits during 1991–1995 and 16,648 visits by adolescents age 11 to 21 during 1991–1996. The rate of counseling for smoking-related diagnoses shown in the chart represents the best performance for any of the most common smoking-related primary diagnoses among smokers in the sample. All rates were weighted to reflect national estimates (Thorndike et al. 1998; 1999).

Chart 1-6: Antibiotic Treatment for Sore Throat. Data are from the 1989–1999 National Ambulatory Medical Care Survey (see Chart 1-5 for description). Physician response rates declined from 74 percent in 1989 to 63 percent in 1999. The analysis included 2,244 visits to primary care physicians by adult patients (age 18 and older) with a chief complaint of sore throat, excluding certain types of patients and visits that might provide an alternative reason for antibiotic use. There was a statistically significant temporal trend toward lower antibiotic prescribing: from 76 percent on average during 1989–1992, to 69 percent on average during 1997–1999 (Linder and Stafford 2001).

Chart 1-7: Antibiotic Treatment for Pneumonia. Baseline data for the Medicare Health Care Quality Improvement Program was collected during 1998 and 1999, including a sample of up to 750 hospital discharges for a six-month period in each state among traditional (fee-for-service) Medicare beneficiaries with a principal diagnosis of pneumonia (Jencks et al. 2000). Excluding Puerto Rico from the results changed median rates only slightly: for blood culture, 82 percent with Puerto Rico vs. 83 percent without Puerto Rico; for antibiotic administration within eight hours, 85 percent with Puerto Rico vs. 86 percent without Puerto Rico.

Chart 1-8: Appropriateness of Procedures. Studies were chosen to be representative of sentinel RAND appropriateness studies. Data were drawn from random samples, including: (1) 642 nonemergency, nonmalignant hysterectomies performed between August 1989 and July 1990 among patients enrolled in seven managed care organizations (Bernstein et al. 1993); (2) 1,139 cataract surgery patients at 10 academic medical centers during 1990 (Tobacman et al. 1996); (3) 386 patients who underwent coronary artery bypass surgery in three randomly selected hospitals (nongovernmental and nonspecialty) in a western state during the years 1979, 1980, and 1982 (Winslow et al. 1988); (4) 1,306 patients undergoing percutaneous transluminal coronary angioplasty in New York State in 1990 (Hilborne et al. 1993); (5) 1,677 Medicare patients undergoing coronary angiography in 1981 at three sites selected from a larger study that included 13 sites in eight states (Chassin et al. 1987).

Chart 1-9: Diabetes Management. Data are from the Behavioral Risk Factor Surveillance System (see Chart 1-3 for description). Estimates for this chart represent 3-year averages for 1997–1999, age-standardized to the 2000

U.S. adult population. Respondents included those who reported that their doctor told them they had diabetes; women who had diabetes only during pregnancy were excluded from the analysis (CDC 2000c).

Chart 1-10: Asthma Management. Data for this Health Plan Employer Data and Information Set measure are collected by health plans from administrative records, as specified by the National Committee for Quality Assurance, and audited by certified independent auditors. Data shown for 2000 represents approximately 272 commercial managed health care organizations covering 63 million lives. The list of medications considered acceptable for long-term asthma control is derived from the National Heart, Lung and Blood Institute's National Asthma Education and Prevention Program guidelines (NCQA 2001a; 2001c).

Chart 1-11: Stroke Prevention. The source is baseline data for the Medicare Health Care Quality Improvement Program (see Chart 1-7 for description) for any hospital discharge diagnosis of atrial fibrillation among patients without contraindications for warfarin (Jencks et al. 2000). Excluding Puerto Rico from the results did not substantially affect the median rate reported.

Chart 1-12: Treatment and Outcomes for HIV. Data included a sample of 2,864 respondents at baseline (1996) and 2,267 at second follow-up (1998) representative of all adults (age 18 and older) with known HIV receiving medical care in the continental U.S. from physicians or facilities other than emergency departments, the military, or prisons. Utilization measures were defined as follows: (1) prophylaxis against *Pneumocystis carinii* pneumonia in the last six months when indicated (CD4 count less than $0.20 \times 10^9/L$); (2) any antiretroviral therapy prior the interview when indicated (CD4 count less than $0.50 \times 10^9/L$); this measure is not shown on the graph due to limited space (94% and 97% compliance in 1996 and 1998, respectively); (3) highly active antiretroviral therapy (protease inhibitor or nonnucleoside reverse transcriptase inhibitor) when indicated by December 1986 (baseline) or January 1998 (follow-up); (4) at least two physician visits in the last six months; (5) one or more emergency department visits without an associated hospitalization in the last six months, and (6) one or more hospitalizations in the last six months (Shapiro et al. 1999).

Chart 1-13: Medication to Prevent Recurrent Heart Attack. The source is baseline data for the Medicare Health Care Quality Improvement Program (see Chart 1-7 for description) for hospital discharges with a principal diagnosis of acute myocardial infarction (Jencks et al. 2000). Patients defined as “ideal candidates for treatment” in the study means patients who met eligibility criteria and did not have documented contraindications to treatment. Excluding Puerto Rico from the results did not substantially affect the median rate reported.

Chart 1-14: Speed to Treatment with Clot-Dissolving Drugs Following a Heart Attack. Data represents 295,056 patients treated from 1990 to 1999 with recombinant tissue-type plasminogen activator (rt-PA) in the National Registry of Myocardial Infarction, an observational study sponsored by Genetech, Inc., which manufactures an rt-PA agent. In a separate analysis of 266,177 patients who received any type of intravenous thrombolytic agent from 1994 to 1999, the median time to treatment was 47 minutes in 1994, compared to 46 minutes shown in chart, and 38 minutes in 1999, the same rate reported in the chart (Rogers et al. 2000).

Chart 1-15: Treatment for Depression. The 1986 Medical Outcomes Study sites included large group-practice HMOs; multi-specialty, mixed prepaid and fee-for-service group practices; and single-specialty, small-group or solo practices in Los Angeles, Boston, and Chicago. Data on use of psychotropic medications was obtained in person or over the telephone for a sample of 634 depressed patients who had an ongoing care relationship, screened positive for current depressive symptoms, and completed a mental health diagnostic test. The 1996-1997 Partners in Care study was an Agency for Healthcare Research and Quality Patient Outcomes Research Team (PORT-II). Sites included geographically dispersed staff-model HMOs, primary care networks, and one rural public health system. Baseline data were collected on 1,204 patients who screened positive for probable depressive disorder, completed a patient assessment questionnaire, planned to use the clinic for the next year, and whose insurance covered behavioral health care provided through the intervention. Medications were assessed when used any day in the previous month, or daily for at least a month during the preceding six months. Appropriate dosage was assessed using a conservative clinician consensus approach in 1986 and based on updated Agency for Healthcare Research and Quality guidelines in 1996-1997 (Wells et al. 1994; Wells et al. 1999).

Chart 1-16: Nursing Home Care. The On-line Survey, Certification, and Reporting (OSCAR) system is a uniform, computerized database of state surveys of all certified nursing facilities in the U.S. Resident characteristics are reported by the nursing facilities based on comprehensive resident assessments done for care planning. State surveyors check accuracy through a review of medical records, interviews, and direct observation (Harrington, Carrillo, and Wellin 2001).

Chart 2-1: Estimated Deaths Associated with Medical Mistakes. The IOM high estimate is an extrapolation of findings from the New York State study (Chart 2-2) to all hospital admission in the U.S. in 1997, assuming that outcomes of preventable adverse events were similar to outcomes of adverse events; the IOM low estimate is an extrapolation of findings from the Colorado/Utah Study to all hospitalizations in 1997 (Chart 2-3) (IOM 2001c).

Chart 2-2: Preventable Adverse Events in New York. The Harvard Medical Practice Study—the most extensive study of adverse events to date—reviewed records of more than 30,000 randomly selected discharges from 51 randomly selected nonpsychiatric hospitals in New York State in 1984. Records were screened by trained nurses and analysts; positive records were independently reviewed by two trained physicians (Brennan et al. 1991). The preventable adverse event rate shown in the chart was calculated by the Chartbook authors as 58 percent of the adverse event rate (Leape et al. 1991).

Chart 2-3: Preventable Adverse Events in Colorado/Utah. Data included a random sample of 15,000 nonpsychiatric discharges from a representative sample of hospitals in Colorado and Utah in 1992 (Thomas et al. 2000). Methodology was similar to the Harvard Medical Practice Study, except that records were reviewed by one physician each. The adverse event rate shown in the chart was recalculated to exclude newborns so as to be comparable to the preventable adverse event rate reported in a separate analysis (Thomas et al. 1999), and therefore differs from the 2.9 percent rate reported in the source (personal communication with Eric Thomas, 2001).

Chart 2-4: Preventable Adverse Drug Events. The study included all 4,031 adult admissions to a stratified random sample of 11 medical and surgical units in two tertiary care hospitals from February to July 1993. Incidents were reported by nurses and pharmacists and detected by daily chart review. Two independent reviewers classified the incidents (Bates et al. 1995).

Chart 2-5: Medication-Prescribing Mistakes. Mistakes were identified by hospital pharmacists, confirmed with the prescribing physician, and reviewed by another clinical pharmacist and one of the study authors. The potential for adverse outcomes was determined based on patient and pharmacological data. A total of 11,186 confirmed medication-prescribing mistakes with potential for adverse events were detected and averted during the nine-year study period (Lesar, Lomaestro, and Pohl 1997).

Chart 2-6: Potentially Inappropriate Prescribing for the Elderly. All studies used modified Beers consensus-based expert criteria (based on the 1991 original list or 1997 update) for drugs that should generally be avoided in the elderly regardless of dosage, frequency, or duration of treatment. Data included: (1) a sample of 6,171 respondents age 65 and older from the 1987 National Medical Expenditure Survey, conducted by the Agency for Healthcare Research and Quality and representative of the U.S. civilian, noninstitutionalized population (Wilcox, Himmelstein, and Woolhandler 1994); (2) in-home interviews conducted during 1989–1990 with 414 elderly people age 75 and older living in Santa Monica, California (Stuck et al. 1994); (3) a sample of 9,182 respondents to the 1992 Medicare Current Beneficiary Survey, representative of noninstitutionalized Medicare beneficiaries age 65 and older (GAO 1995); (4) interviews with a sample of 2,054 elderly residents of 410 board and care facilities in 10 states during 1993 (Spore et al. 1997); (5) a sample of 2,455 respondents age 65 and older from the 1996 Medical Expenditure Panel Survey representative of the U.S. civilian, noninstitutionalized population (Zhan et al. 2001); (6) admission records and a nursing questionnaire for 6,718 home health care patients age 65 and older admitted to selected offices of two large urban agencies from October 1996 to September 1998 (Meredith et al. 2001).

Chart 3-1 to 3-3: Effect of Being Uninsured on Access to Primary and Preventive Care. Data from the Behavioral Risk Factor Surveillance System (see Chart 1-3 for description) included over 100,000 adults in both 1997 and 1998 in all 50 states and the District of Columbia, except that questions

about diabetic eye and foot exam were asked in 37 states. Preventive care measures shown in the graph represent a subset of those reported in the study. Questions about mammography, pap tests, and diabetic eye and foot exams were asked in 1998; questions about screening for colorectal cancer, hypertension, and cholesterol were asked in 1997. Rates shown in the graphs were adjusted to control for the effects of age, gender, race/ethnicity, region, employment status, education, and income; all differences between the uninsured and the insured shown in the graphs were statistically significant (Ayanian et al. 2000).

Chart 3-4: Unmet Needs of Children with Special Health Care Needs. Data represents 57,553 interviews with adults knowledgeable about the health status of sample children (under age 18), from the 1994–1995 National Health Interview Survey on Disability, conducted by the Census Bureau for the NCHS. Rates were statistically weighted to reflect the national population. In a separate analysis, differences in access shown in the graph remained statistically significant after adjusting for confounding factors including age, gender, race/ethnicity, poverty status, parental education, living arrangement, region, place of residence, and health status (Newacheck et al. 2000).

Chart 3-5: Effect of Having a Regular Source of Health Care on Access to Preventive Care. Data are from the 1998 National Health Interview Survey (see Chart 1-2 for description). Respondents who had never heard of the test or who reported a test within an unknown time period were considered missing responses. In a separate analysis controlling for age, race, education, and insurance coverage, those with a usual source of care were 3.5 to 5.2 times more likely to receive screening tests than those without a usual source of care (Breen et al. 2001).

Chart 3-6: Timely Initiation of Prenatal Care. The National Vital Statistics System, administered by the NCHS, obtains data on prenatal care and race/ethnicity as recorded on birth certificates for the 50 states and the District of Columbia. Data on ethnicity was available for 22 states in 1980, 23 states and the District of Columbia (D.C.) for 1985, 48 states and D.C. for 1990, and 50 states and D.C. for 1995 and 1999; data on race was available for all states and D.C. in all years shown (Eberhardt et al. 2001, Table 6).

Chart 3–7: Dental Care. Data are from the 1999 National Health Interview Survey (see Chart 1–2 for description). The rate for the total population (age 2 and older) is age-standardized to the 2000 population. The elderly includes those without teeth, which represent about 29–30 percent of people age 65 and older. In 1997–1999, about 70 percent of elderly people with teeth visited a dentist in the past year, compared to only 17–18 percent of those without teeth (Eberhardt et al. 2001, Table 80).

Chart 4–1: Perceptions of Health Care Quality. Data for the pie chart on public perceptions are from a Gallup poll of 1,005 adults conducted November 8–11, 2001, with a sampling error of 3 percent (National Journal Poll Track 2001). The Commonwealth Fund International Health Policy Survey was conducted by mail, telephone, and Internet from April to July 2000 by Harris Interactive and included 528 generalist physicians and a sample of cardiologists, gastroenterologists, and oncologists in the U.S., with a sampling error of 4 percent (Blendon et al. 2001).

Chart 4–2: Public Perceptions of the Health Care System. Data are from the following public opinion polls: (1) Harris, January 26, 2000; (2) Harris, May 10, 2000; (3) Harvard School of Public Health/ICR, August 16, 2000; (4) Harris, May 10, 2000; (5) Harris, July 19, 2000; and (6) Harvard School of Public Health/ICR, August 16, 2000 (Blendon and Benson 2001).

Chart 4–3 to 4–5: Consumer Assessment of Health Plans (CAHPS®). CAHPS® is a set of standard surveys and report templates established by the Agency for Healthcare Research and Quality and administered by mail or telephone to a random sample of health plan enrollees by independent survey vendors, following a standard protocol, with target response rates of 55 percent for commercial plans and 45 percent for Medicaid plans (NCQA 2001c; www.ahrq.gov). Separate instruments are used for adults to rate their own experience and for parents concerning the experience of their children. The National Committee for Quality Assurance reports aggregate CAHPS® data on commercial and Medicaid health plans collected as part of the Health Plan Employer Data and Information Set (NCQA 2001b). Aggregate data on Medicare health plans is reported by the Centers for Medicare and Medicaid Services, which contracts with a single vendor to administer a Medicare CAHPS® survey (CMS 2001b).

Chart 4–6: Patient Reports of Problems with Hospital Care. Picker surveys were developed from research into which issues patients consider important and were extensively pilot-tested. Data are from about 47,576 completed surveys (response rate 46%) that were mailed to all patients or a random sample of patients within one month of discharge from 272 U.S. hospitals during a one-year period in 1998–1999. A total of 40 questions were asked about seven dimensions of care; a dimension score of zero means there were no reported problems, while 100 means all items were rated a problem (Coulter and Cleary 2001).

Chart 4–7: Time Spent with Physician. Data from the 1989–1999 National Ambulatory Medical Care Survey (see Chart 1–5 for description) included 24,715 to 43,469 sampled visits per year (response rate 68% to 74% over the 10-year period). The physician or his/her staff provided data about the duration of each sampled visit. The Socioeconomic Monitoring System is conducted by the American Medical Association among nonfederal physicians engaged primarily in patients care (response rate 52% to 72% over the 10-year period). “The average duration of an office visit was estimated by dividing the average number of hours the physician reported spending with patients in his or her office each week by the average number of patients the physician reported seeing per week.” The increase in office visit duration from 1989 to 1998 was statistically significant for both surveys (Mechanic, McAlpine, and Rosenthal 2001).

Charts 4–8 to 4–10: Satisfaction with Nursing Home Care. The National Nursing Home Survey was based on a telephone survey conducted by ICR/International Communications Research from April 23, 2001 to June 3, 2001 among a randomly selected, nationally representative sample of 1,309 adults (age 18 and older). Data shown in the charts represents a subsample of 323 respondents with “substantial nursing home experience” (as defined in the footnote on the chart), with a sampling error of 6 percentage points (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health 2001).

Chart 5–1: Racial/Ethnic Disparity in Preventive Care. Data are from the second (1998–1999) Household Survey, a nationally representative telephone survey of more than 60,000 persons in 33,000 families living in 60 communities, as part of the Center for Studying Health System Change Community Tracking Study. Results are weighted to be representative of the U.S. civilian, noninstitutionalized population (Hargraves 2001).

Chart 5–2: Racial Disparity in Lung Cancer Surgery and Survival. Data included 10,984 black and white patients age 65 and older diagnosed with resectable, non-small-cell lung cancer (stage I or II) between 1985 and 1993 in 10 study areas of the Surveillance, Epidemiology, and End Results (SEER) program. Data are from linked SEER registry database and Medicare hospital discharge records. In a separate analysis, black patients were about half as likely as whites to undergo surgery after controlling for factors that predict candidacy for surgery: age, gender, stage of disease, income (by ZIP code area), and coexisting illness (Bach et al. 1999).

Chart 5–3: Racial Disparity in Use of Invasive Heart Procedures. Data included 12,402 black and white patients who underwent a first cardiac catheterization at Duke University Medical Center from March 1984 through December 1992 and were found to have obstructive coronary disease. Patients were excluded if they had previously undergone revascularization, underwent catheterization primarily for evaluation of ventricular arrhythmia, had substantial valvular disease, underwent only selected right or left angiography, or had incomplete clinical histories. Patients were contacted yearly (for an average of five years) to track their status and determine whether they had received any revascularization procedure. Differences in rates discussed in the narrative reflect odds ratios that were adjusted to take into account baseline demographic characteristics, severity of disease, coexisting illness, and access to subspecialty cardiology care. Difference in five-year survival reported in the narrative was adjusted for baseline prognostic factors (Peterson et al. 1997).

Chart 5–4: Gender Disparity in Heart Attack Treatment. The study population included 138,956 Medicare patients with confirmed acute myocardial infarction admitted directly to hospitals in 46 states and Puerto Rico during 1995–1995 (Gan et al. 2000). Ideal candidates for therapy are those who met eligibility criteria and had no documented contraindications. The graph includes only drug therapies with statistically significant differences in rates of use among women vs. men, as determined in a separate analysis that controlled for the effects of age, race, severity of illness, and geographic region. Crude rates are shown in the graph, while adjusted differences (odds) are described in the narrative. We did not include invasive procedures in the chart due to uncertainty about overuse or underuse. Although the study reported no significant difference between women and men in short-term adjusted survival rates, longer-term outcomes need to be measured to determine the full impact of the disparities.

Chart 5–5: Racial Disparity in Access to Kidney Transplants. Data were derived from medical records and a survey of a random sample of 1,518 Medicare patients age 18 to 54 with end stage renal disease who started kidney dialysis in five states (Alabama, southern California, Michigan, Maryland, and Virginia) and the District of Columbia between May 1996 and June 1997. Survey responses were obtained for 1,169 (77 percent) of these patients, part of a cohort of 1,392 patients in another study that served as the source of data on patient preferences shown in the chart (Ayanian et al 1999). Appropriateness ratings were based on a literature review and the judgments of an expert panel. Data shown in the chart are unadjusted rates, using referral rates from the chart review. In a separate analysis, blacks remained significantly less likely to be referred for evaluation, to be placed on a waiting list, and to receive a transplant after controlling for the effects of potentially confounding sociodemographic, clinical, and access factors. Although blacks were less likely than whites to be clinically appropriate candidates for transplants and to desire a transplant, significant disparity remained even after controlling for these factors (Epstein et al. 2000).

Chart 5–6: Racial Disparity in Cancer Pain Management. Data for the first study was collected from a survey of 1,308 outpatients with metastatic cancer and their physicians at 54 academic or community hospitals and practices from October 1990 to September 1991; patients who had surgery in the last 30 days or who were too ill or unable to comprehend the survey were not included. Adequacy of pain was assessed based on World Health Organization guidelines using a pain management index that compared patients' reported severity of pain to the most potent analgesic prescribed them. Inadequate pain management is defined as a negative score on the pain management index. In a separate analysis, minorities were three times more likely to have inadequate pain management (Cleeland et al. 1994). The second study included 13,625 cancer patients age 65 and older who were discharged from the hospital to nursing homes in five states (Kansas, Maine, Mississippi, New York, and South Dakota) from 1992 to 1995. Nursing home personnel recorded pain medications and assessed whether each resident complained or showed evidence of daily pain over a seven-day period. Crude rates shown in the chart were calculated by the Chartbook authors from data in Table 4 of the source. In a separate analysis controlling for potential confounding factors, African-Americans were 63 percent more likely than white residents not to receive any pain medication when in daily pain (Bernabei et al. 1998).

Chart 5–7: Effect of Race/Ethnicity and Language on Parents’ Assessments of Pediatric Care. Results shown in the chart represent regression beta-coefficients relative to white parents, controlling for parent’s age, gender, and education, as well as child’s health status. Data were derived from the National Consumer Assessment of Health Plans Benchmarking Database 1.0, including 9,540 children (under age 18) enrolled in Medicaid managed health care plans in Arkansas, Kansas, Minnesota, Oklahoma, Vermont, and Washington state in 1997 and 1998. Surveys were administered in English and Spanish by phone and mail (42% average response rate). Language for Hispanic and Asian parents was based on what she/he reported primarily speaking at home. Ratings for non-English-speaking Hispanic and Asian parents were significantly different from white parents, except for “Getting Needed Care” for Hispanic Spanish-speaking parents. Ratings for English-speaking Hispanic and Asian parents were not significantly different from white parents (Weech-Maldonado et al. 2001).

Chart 6–1: Improving Immunization Rates. This chart presents the results of a Cochrane systematic review of 41 controlled studies published through 1998 evaluating the effects of patient reminders for immunizations that were due or immunization visits that were upcoming, and recall for immunizations that were overdue. Studies included randomized controlled trials, controlled before-and-after studies, and interrupted time series studies that met explicit review criteria. The chart shows absolute (percentage point) change in immunization rates from the study. The study also reported weighted, pooled odds ratios for being up-to-date or having received vaccinations, as described in the chart narrative. The odds ratios corresponding to the categories shown in the chart were statistically significant (Szilagyi et al. 2000).

Chart 6–2: Reducing Unnecessary Antibiotic Use. This was a prospective, nonrandomized, controlled trial measuring antibiotic prescribing for consecutive patients with uncomplicated acute bronchitis visiting four selected primary care practices of a group-model health maintenance organization in Denver, Colorado. The sample included 2,462 adult patients at baseline (November 1996 to February 1997) and 2,027 in the study period (November 1997 to

February 1998). The change in the antibiotic prescribing rate for the full intervention site (as described in the chart narrative) was statistically significant. There was no significant change in prescribing at two control (usual care) sites or at a limited, office-based educational intervention site. A separate analysis found no increase in antibiotic prescribing for potential substitute diagnoses during the intervention. Examples of educational materials can be viewed at: www.uchsc.edu/uh/gim/educate/bronchitis.html (Gonzales et al. 1999).

Chart 6–3: Improving Diabetes Management. This was a before-and-after intervention trial based on two, separate random samples of medical records (380 at baseline in 1995 and 767 at post-intervention remeasurement in 1996) for Medicare patients with type 2 diabetes continuously enrolled for at least one year in one of six Arizona managed care plans. The Medicare Peer Review Organization (PRO) reviewed the records to determine the proportion of 14 quality indicator services that were provided to patients when needed during a one-year period. Diabetes monitoring indicators included quarterly blood pressure measurement, biannual foot exam, biannual glycosylated hemoglobin test, annual eye exam, annual lipid profile, and annual dipstick for urine protein. Diabetes education measures included diet, exercise, medication, and glucose self-monitoring. Follow-up measured whether an ACE inhibitor was prescribed if the patient had hypertension or proteinuria, treatment was provided for hyperlipidemia, and patients with abnormal eye exams were referred to an ophthalmologist (Marshall et al. 2000).

Chart 6–4: Improving Medical Treatment for Heart Attack. This before-and-after study used a pre-intervention sample of 13,946 hospital discharges from June 1992 through December 1992, and a post-intervention sample of 8,163 hospital discharges from August 1995 through November 1995, for Medicare patients with a principal diagnosis of acute myocardial infarction in Alabama, Connecticut, Iowa, and Wisconsin. Mortality comparisons used hospital claims for all Medicare patients nationwide. There was no statistically significant difference in mortality rates between intervention states and the rest of the nation at baseline, while intervention states had a slightly but statistically significant lower rate post-intervention (Marciniak et al. 1998).

Chart 6-5: Improving Outcomes of Heart Bypass Surgery. This was a before-and-after intervention study using clinical data collected on 15,095 consecutive patients undergoing isolated coronary artery bypass graft (CABG) surgery in Maine, New Hampshire, and Vermont from July 1987 through July 1993 (with expanded analysis through 1996). A multivariate regression model, which controlled for changes in patients undergoing CABG over time, was used to predict hospital mortality during the post-intervention period in comparison to observed mortality rates, in order to judge the effects of the intervention, which is described in the chart narrative (O'Connor et al. 1996).

Chart 6-6: Improving Treatment and Outcomes for Depression. The Partners in Care study was a group-level randomized controlled trial (see Chart 1-15 for description). The sample included 1,356 adult patients, with 913 in the intervention group and 443 in the control group. Probable depressive disorder was defined as having “two weeks or more of depressed mood or loss of interest in pleasurable activities during the last year or persistent depression over the year, plus having at least one week of depression in the last 30 days.” Enrolled patients completed a telephone interview (95% response rate) and a mail survey at baseline (88% response rate), with follow-up surveys every six months (response rate 85% at six months and 83% at 12 months) during 1996-1997. There were no significant differences between intervention and control patients at baseline in use of services, health-related quality-of-life, or employment status. Rates shown in the charts are adjusted values at 12-month follow-up for the control group and combined intervention groups (the intervention is described in the chart narrative). Differences between rates shown for control and intervention groups were statistically significant (Wells et al. 2000).

Chart 6-7: Reducing Pressure Ulcers in the Nursing Home. This study was based on 144,379 observations recorded between 1991 and 1995 by nursing home staff on Minimum Data Set resident assessments for 30,510 residents of 107 National HealthCare Corporation nursing homes located in nine states. Six-month rates of pressure ulcer development were calculated as the proportion of residents without an ulcer who had a stage 2-4 ulcer on a subsequent assessment (stage 1 ulcers are difficult to detect and often do not worsen). Rates were risk-adjusted to control for changes in resident characteristics. Residents with a readmission during any period were excluded from the analysis in that period to ensure that any pressure ulcer developed in the nursing home. The temporal decline in pressure ulcer development was statistically significant (Berlowitz et al. 2000).

Chart 6-8: Preventing Medication Mistakes. The study included all patients admitted to two general care medical units and one medical intensive care unit at Brigham and Women's Hospital, Boston, a 700-bed academic tertiary-care hospital. Data were collected over four years. At baseline (51 days in October-November 1992), all prescriptions were written manually. At Period 1 (68 days, October-December 1993), a physician order entry system was implemented including medication name, dose, and frequency selection from standard lists; display of relevant laboratory results; limited drug-allergy checks; redundant medication checking; and notification of a few life-threatening drug-to-drug interactions and drug-laboratory problems. At Period 2 (49 days, November-December 1995), improved drug-allergy checking was implemented. At Period 3 (52 days, March-April 1997), improved drug-to drug interaction checking was implemented, along with improved potassium ordering rules. Medication mistakes, adverse events, and potential adverse events were detected by: 1) pharmacists during dispensing and solicited from nurses during daily visits, 2) evaluation by trained reviewers of medication sheets received by the pharmacy, and 3) chart review by a study investigator (Bates et al. 1999).

References

- Adams, D. 2001. Push to improve patient safety slow-going. *American Medical News*, 7 May.
- Adams, R. J., A. Fuhlbrigge, J. A. Finkelstein, et al. 2001. Impact of inhaled anti-inflammatory therapy on hospitalization and emergency department visits for children with asthma. *Pediatrics* 107:706–711.
- Agency for Healthcare Research and Quality (AHRQ). 1993. *Treatment of major depression: Clinical practice guideline Number 5*. Washington, D.C.: U.S. Department of Health and Human Services.
- Agency for Healthcare Research and Quality (AHRQ). 1999. *Treatment of depression—newer pharmacotherapies: Evidence report/technology assessment Number 7*. Washington, D.C.: U.S. Department of Health and Human Services.
- American Cancer Society (ACS). 2001. *Cancer facts & figures 2001*. Atlanta, Ga.: American Cancer Society.
- American College of Physicians/American Society of Internal Medicine (ACP/ASIM). 2000. *No health insurance? It's enough to make you sick. Scientific research linking the lack of health coverage to poor health*. Washington, D.C.: ACP/ASIM.
- American Diabetes Association (ADA). 2001. *Facts & figures: The impact of diabetes*. Alexandria, Va.: American Diabetes Association.
- American Gastroenterological Association (AGA). 1997. Colorectal cancer screening: Clinical guidelines and rationale. *Gastroenterology* 112:594–642.
- American Heart Association (AHA). 2001. *Heart and stroke statistical update*. Dallas, Tex.: American Heart Association.
- American Hospital Association (AHA). 1996. *Eye on Patients*. Chicago: American Hospital Association and the Picker Institute.
- American Medical Association (AMA). 2001. Colorectal cancer: Screening and surveillance. *Quality Care Alert*, 12 July.
- Aparasu, R. R., and J. R. Mort. 2000. Inappropriate prescribing for the elderly: Beers criteria-based review. *Annals of Pharmacotherapy* 34:338–346.
- Asch, S. M., E. A. Kerr, E. G. Hamilton, et al., eds. 2000. *Quality of care for oncologic conditions and HIV: A review of the literature and quality indicators*. Santa Monica, Calif.: RAND Health.
- Ayanian, J. Z., P. D. Cleary, J. S. Weissman, et al. 1999. The effect of patients' preferences on racial differences in access to renal transplantation. *New England Journal of Medicine* 341:1661–1669.
- Ayanian, J. Z., J. S. Weissman, E. C. Schneider, et al. 2000. Unmet health needs of uninsured adults in the United States. *Journal of the American Medical Association* 284:2061–2069.
- Bach, P. B., L. D. Cramer, J. L. Warren, et al. 1999. Racial differences in the treatment of early-stage lung cancer. *New England Journal of Medicine* 341:1198–1205.
- Balas, E. A., S. Weingarten, C. T. Garb, et al. 2000. Improving preventive care by prompting physicians. *Archives of Internal Medicine* 160:301–308.
- Barron, H. V., L. J. Bowlby, R. Breen, et al. 1998. Use of reperfusion therapy for acute myocardial infarction in the United States: Data from the National Registry of Myocardial Infarction 2. *Circulation* 97:1150–1156.
- Bartlett, J. G., S. F. Dowell, L. A. Mandell, et al. 2000. Practice guidelines for the management of community-acquired pneumonia in adults. *Clinical Infectious Diseases* 31:347–382.
- Bates, D. W., D. J. Cullen, N. Laird, et al. 1995. Incidence of adverse drug events and potential adverse events. *Journal of the American Medical Association* 274:29–34.
- Bates, D. W., N. Speil, D. J. Cullen, et al. 1997. The costs of adverse drug events in hospitalized patients. *Journal of the American Medical Association* 277:307–311.

- Bates, D. W., J. M. Teich, J. Lee, et al. 1999. The impact of computerized physician order entry on medication error prevention. *Journal of the American Medical Informatics Association* 6:313–321.
- Berlowitz, D. R., G. H. Brandeis, J. Anderson, et al. 1997. Effect of pressure ulcers on the survival of long-term care residents. *Journal of Gerontology: Medical Sciences* 52A, M106–M110.
- Berlowitz, D. R., H. Q. Bezerra, G. H. Brandeis, et al. 2000. Are we improving the quality of nursing home care: The case of pressure ulcers. *Journal of the American Geriatric Society* 48:59–62.
- Bernabei, R., G. Gambassi, K. Lapane, et al. 1998. Management of pain in elderly patients with cancer. *Journal of the American Medical Association* 279:1877–1882.
- Bernstein, S. J., E. A. McGlynn, A. L. Siu, et al. 1993. The appropriateness of hysterectomy: A comparison of care in seven health plans. *Journal of the American Medical Association* 269:2398–2404.
- Birkmeyer, J. D., and C. M. Birkmeyer. 2000. *Leapfrog safety standards: The potential benefits of universal adoption*. Washington, D.C.: The Leapfrog Group.
- Blendon, R. J., and J. M. Benson. 2001. Americans' views on health policy: A fifty-year historical perspective. *Health Affairs* 20(2):33–46.
- Blendon, R. J., C. Schoen, K. Donelan, et al. 2001. Physicians' view on quality of care: A five country comparison. *Health Affairs* 20(3):233–243.
- Breen, N., D. K. Wagener, M. L. Brown, et al. 2001. Progress in cancer screening over a decade: Results of cancer screening from the 1987, 1992, and 1998 National Health Interview Surveys. *Journal of the National Cancer Institute* 93:1704–1713.
- Brennan T. A., L. L. Leape, N. M. Laird, et al. 1991. Incidence of adverse events and negligence in hospitalized patients: Results of the Harvard Medical Practice Study I. *New England Journal of Medicine* 324:370–376.
- Brown, M. L., J. Lipscomb, and C. Snyder. 2001. The burden of illness of cancer: economic cost and quality of life. *Annual Review of Public Health* 22:91–113.
- Centers for Disease Control and Prevention (CDC). 1995. Influenza and pneumococcal vaccination coverage levels among persons aged ≥ 65 years—United States, 1973–1993. *Morbidity and Mortality Weekly Report* 44:506–515.
- Centers for Disease Control and Prevention (CDC). 1997. Prevention of pneumococcal disease. *Morbidity and Mortality Weekly Report* 46(RR-8):1–24.
- Centers for Disease Control and Prevention (CDC). 1998a. Demographic characteristics of persons without a regular source of medical care—selected states, 1995. *Morbidity and Mortality Weekly Report* 47:277–279.
- Centers for Disease Control and Prevention (CDC). 1998b. Recommendations of the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians: Use of reminder and recall by vaccination providers to increase vaccination rates. *Morbidity and Mortality Weekly Report* 47:715–717.
- Centers for Disease Control and Prevention (CDC). 1999. Reasons reported by Medicare beneficiaries for not receiving influenza and pneumococcal vaccinations—United States, 1996. *Morbidity and Mortality Weekly Report* 48:886–890.
- Centers for Disease Control and Prevention (CDC). 2000a. Influenza, pneumococcal, and tetanus toxoid vaccination of adults—United States, 1993–1997. *Morbidity and Mortality Weekly Report* 49(SS09):39–62.
- Centers for Disease Control and Prevention (CDC). 2000b. Use of standing orders programs to increase adult vaccination rates. *Morbidity and Mortality Weekly Report* 49(RR-1):21–26.
- Centers for Disease Control and Prevention (CDC). 2000c. Levels of diabetes-related preventive-care practices—United States, 1997–1999. *Morbidity and Mortality Weekly Report* 49:954–957.
- Centers for Disease Control and Prevention (CDC). 2001a. National, state, and urban area vaccination coverage levels among children aged 19–35 months—United States, 2000. *Morbidity and Mortality Weekly Report* 50:637–641.
- Centers for Disease Control and Prevention (CDC). 2001b. Prevention and control of influenza. *Morbidity and Mortality Weekly Report* 50(RR-4):1–35.
- Centers for Disease Control and Prevention (CDC). 2001c. Trends in screening for colorectal cancer—United States, 1997 and 1999. *Morbidity and Mortality Weekly Report* 50:161–166.

- Centers for Disease Control and Prevention (CDC). 2001d. HIV and AIDS—United States, 1981–2000. *Morbidity and Mortality Weekly Report* 50:430–434.
- Centers for Disease Control and Prevention (CDC). 2002a. Pertussis—United States, 1997–2000. *Morbidity and Mortality Weekly Report* 51:73–76.
- Centers for Disease Control and Prevention (CDC). 2002b. *Early release of selected estimates from the National Health Interview Survey*. Data from January–June 2001 (Released 4 February). Hyattsville, Md.: National Center for Health Statistics.
- Centers for Medicare and Medicaid Services (CMS). 2000. *National clinical topics for the Medicare health care quality improvement initiative*. Washington, D.C.: U.S. Department of Health and Human Services.
- Centers for Medicare and Medicaid Services (CMS). 2001a. *Nursing home compare*. Washington, D.C.: U.S. Department of Health and Human Services, www.medicare.gov/NHCompare/home.asp.
- Centers for Medicare and Medicaid Services (CMS). 2001b. *Medicare health plan compare* (data tables). Washington, D.C.: U.S. Department of Health and Human Services, <http://www.medicare.gov/mphCompare/home.asp>.
- Chassin, M. R. 1997. Assessing strategies for quality improvement. *Health Affairs* 16(3):151–161.
- Chassin, M. R., J. Koseoff, R. E. Park, et al. 1987. Does inappropriate use explain geographic variations in the use of health care services? *Journal of the American Medical Association* 258:2533–2537.
- Cleary, P. D., S. Edgman-Levitan, M. Roberts, et al. 1991. Patients evaluate their hospital care: A national survey. *Health Affairs* 10(4):254–267.
- Cleeland, C. S., R. Gonin, A. K. Hatfield, et al. 1994. Pain and its treatment in outpatients with metastatic cancer. *New England Journal of Medicine* 330:592–596.
- Collins, K. S., A. Hall, and C. Neuhaus. 1999. *U.S. minority health: A chartbook*. New York: The Commonwealth Fund.
- Colmers, J. M., D. M. Fox, S. Praeger, et al. 1999. *Pediatric dental care in CHIP and Medicaid*. New York: Milbank Memorial Fund and The Reforming States Group, www.milbank.org/990716mrpd.html.
- Cooper, R. J., J. R. Hoffman, J. G. Bartlett, et al. 2001. Principles of appropriate antibiotic use for acute pharyngitis in adults: background. *Annals of Internal Medicine* 134:509–517.
- Coulter A. 2001. *Patient engagement* (invited paper). London: The Commonwealth Fund and the Nuffield Trust.
- Coulter, A., and P. D. Cleary. 2001. Patients' experiences with hospital care in five countries. *Health Affairs* 20(3):244–252.
- Department of Health and Human Services (DHHS). 2000. *Healthy people 2010: Understanding and improving health*. 2nd ed. Washington, D.C.: Government Printing Office.
- Department of Health and Human Services (DHHS). 2001. *HHS to provide nursing home quality information to increase safety and quality in nursing homes* (press release). Washington, D.C.: U.S. Department of Health and Human Services, 19 November.
- Donelon, K., R. J. Blendon, C. Schoen, et al. 1999. The cost of health system change: public discontent in five nations. *Health Affairs* 18(3):206–216.
- Dubay, T. Joyce, R. Kaestner, et al. 2001. Changes in prenatal care timing and low birth weight by race and socioeconomic status: implications for the Medicaid expansions for pregnant women. *Health Services Research* 36:373–398.
- Dwight-Johnson, M., C. D. Sherbourne, D. Liao, et al. 2000. Treatment preferences among depressed primary care patients. *Journal of General Internal Medicine* 15:527–534.
- Dwight-Johnson, J., J. Unützer, C. Sherbourne, et al. 2001. Can quality improvement programs for depression in primary care address patient preferences for treatment? *Medical Care* 39:934–944.
- Eberhardt, M.S., D. D. Ingram, D. M. Makuc, et al. 2001. *Health, United States, 2001* (with updated tables as of October 2001). Hyattsville, Md.: National Center for Health Statistics.
- Eisenberg, J. M. 2001. Overview of the issue. *Health Services Research* 36:443–446.
- Epstein, A. M., J. Z. Ayanian, J. H. Keogh, et al. 2000. Racial disparities in access to renal transplantation. *New England Journal of Medicine* 343:1537–1544.

- Fendrick, A. M., P. M. Ridker, B. S. Bloom. 1994. Improved health benefits of increased use of thrombolytic therapy. *Archives of Internal Medicine* 154:1605–1609.
- Ferlie, E. B., and S. M. Shortell. 2001. Improving the quality of health care in the United Kingdom and the United States: A framework for change. *Milbank Quarterly* 79:281–315.
- Fiscella, K., P. Franks, M. R. Gold, et al. 2000. Inequality in quality: Addressing socioeconomic, racial, and ethnic disparities in health care. *Journal of the American Medical Association* 283:2579–2584.
- Fiscella, K., P. Franks, M. P. Doescher, et al. 2002. Disparities in health care by race, ethnicity, and language among the insured: Findings from a national sample. *Medical Care* 40:52–59.
- Flores, G., M. Abreu, M. A. Olivar, et al. 1998. Access barriers to health care for Latino children. *Archives of Pediatric and Adolescent Medicine* 152:1119–1125.
- Freudenheim, M. 2000. Companies start fund to reward hospitals for better care. *The New York Times*, 18 January.
- Gan, S. C., S. K. Beaver, P. M. Houck, et al. 2000. Treatment of acute myocardial infarction and 30-day mortality among women and men. *New England Journal of Medicine* 342:8–15.
- General Accounting Office (GAO). 1995. *Prescription drugs and the elderly: Many still receive potentially harmful drugs despite recent improvements*. Report No. GAO/HEHS-95-152. Washington, D.C.: U.S. General Accounting Office.
- Gerteis, M., S. Edgman-Levitan, J. Daley, et al, eds. 1993. *Through the patient's eyes: Understanding and promoting patient-centered care*. San Francisco: Jossey-Bass Publishers.
- Gibson, P. G., J. Coughlan, A. J. Wilson, et al. 2001. Self-management education and regular practitioner review for adults with asthma (Cochrane review). In *The Cochrane Library* 3, Oxford: Update Software.
- Gonzales, R., J. F. Steiner, A. Lum, et al. 1999. Decreasing antibiotic use in ambulatory practice: Impact of a multidimensional intervention on the treatment of uncomplicated acute bronchitis in adults. *Journal of the American Medical Association* 281:1512–1519.
- Gonzales, R., J. F. Steiner, J. Maselli, et al. 2001. Impact of reducing antibiotic prescribing for acute bronchitis on patient satisfaction. *Effective Clinical Practice* 4(3):105–11.
- Gorelick, P. B., R. L. Sacco, D. B. Smith, et al. 1999. Prevention of a first stroke: A review of guidelines and a multidisciplinary consensus statement from the National Stroke Association. *Journal of the American Medical Association* 281:1112–1120.
- Guadagnoli, E., A. M. Epstein, A. Zaslavsky, et al. 2000. Providing consumers with information about the quality of health plans: The Consumer Assessment of Health Plans demonstration in Washington State. *Joint Commission Journal of Quality Improvement* 26:410–420.
- Guadagnoli, E., P. J. Hauptman, J. Z. Ayanian, et al. 1995. Variation in the use of cardiac procedures after acute myocardial infarction. *New England Journal of Medicine* 333:573–578.
- Halterman, J. S., C. A. Aligne, P. Auinger, et al. 2000. Inadequate therapy for asthma among children in the United States. *Pediatrics* 105:272–276.
- Hammermeister, K. E., A. L. Shroyer, G. K. Sethi, et al. 1995. Why it is important to demonstrate linkages between outcomes of care and processes and structures of care. *Medical Care* 33(10 Supplement):OS5–16.
- Hargraves, L. J. 2001. *Race, ethnicity and preventive services: no gains for Hispanics*. Issue Brief No. 34. Washington, D.C.: Center for Studying Health System Change.
- Harrington, C., H. Carrillo, and V. Wellin. 2001. *Nursing facilities, staffing, residents, and facility deficiencies, 1994 through 2000*. San Francisco: University of California, Department of Social and Behavioral Sciences.
- Hawley, S. T., J. A. Earp, M. O'Malley, et al. 2000. The role of physician recommendation in women's mammography use: Is it a 2-stage process? *Medicare Care* 38:392–402.
- Heffler, S., K. Levit, S. Smith, et al. 2001. Health spending growth up in 1999. *Health Affairs* 20(2):193–203.
- Hemingway H., A. M. Crook, G. Feder, et al. 2001. Underuse of coronary revascularization procedures in patients considered appropriate candidates for revascularization. *New England Journal of Medicine* 344:645–654.

- Hilborne, L. H., L. L. Leape, S. J. Bernstein, et al. 1993. The appropriateness of use of percutaneous transluminal coronary angioplasty in New York State. *Journal of the American Medical Association* 269:761–765.
- Institute of Medicine (IOM). 1986. *Improving the quality of care in nursing homes*, edited by J. Takeuchi, R. Burke, and M. McGeary. Washington, D.C.: National Academy Press.
- Institute of Medicine (IOM). 1990. *Medicare: A strategy for quality assurance*, edited by Kathleen Lohr. Washington, D.C.: National Academy Press: 21.
- Institute of Medicine (IOM). 1993. *Access to health care in America*. Washington, D.C.: National Academy Press.
- Institute of Medicine (IOM). 2000. *To err is human: Building a safer health system*, edited by L. T. Kohn, J. M. Corrigan, and M. S. Donaldson. Washington, D.C.: National Academy Press.
- Institute of Medicine (IOM). 2001a. *Crossing the quality chasm: A new health system for the 21st century*, edited by J. M. Corrigan, M. S. Donaldson, L. T. Kohn, et al. Washington, D.C.: National Academy Press.
- Institute of Medicine (IOM). 2001b. *Envisioning the national health care quality report*, edited by M. P. Hurtado, E. K. Swift, Janet M. Corrigan, et al. Washington, D.C.: National Academy Press.
- Institute of Medicine (IOM). 2001c. *Coverage matters: Insurance and health care*. Washington, D.C.: National Academy Press.
- Jencks, S. F., T. Cuerdon, D. R. Burwen, et al. 2000. Quality of medical care delivered to Medicare beneficiaries: A profile at state and national levels. *Journal of the American Medical Association* 284:1670–1676.
- Johnson, H. P. 1999. How many Californians? *A review of population projections for the state. California counts, population trends and profiles*. San Francisco: Public Policy Institute of California.
- Johnson, M. F., and A. M. Kramer. 2000. *Quality of care problems persist in nursing homes despite improvements since the nursing home reform act*. Paper prepared for the Institute of Medicine Committee on Improving Quality in Long-Term Care. Washington, D.C.: Institute of Medicine.
- Joint Commission on Accreditation of Healthcare Organizations (JCAHO). 2001. A follow-up review of wrong site surgery. *Sentinel Event Alert* 24, 5 December.
- Kaiser Family Foundation/Agency for Healthcare Research and Quality (KFF/AHRQ). 1996. *Americans as health care consumers: The role of quality information*. Menlo Park, Calif.: Kaiser Family Foundation/Agency for Healthcare Research and Quality.
- Kaiser Family Foundation (KFF). 2001. *Hablamos Juntos: Improving patient-provider communication for Latinos*. Fact Sheet. Menlo Park, Calif.: Kaiser Family Foundation.
- Kramarow, E., H. Lentzner, R. Rooks, et al. 1999. *Health, United States, 1999*. Hyattsville, Md.: National Center for Health Statistics.
- Kerr, E. A., S. A. Asch, E. G. Hamilton, et al., eds. 2000. *Quality of care for cardiopulmonary conditions: A review of the literature and quality indicators*. Santa Monica, Calif.: RAND Health.
- Kressin, N. R., and L. A. Petersen. 2001. Racial differences in the use of invasive cardiovascular procedures: Review of the literature and prescription for future research. *Annals of Internal Medicine* 135:352–366.
- Leape L. L., T. A. Brennan, N. Laird, et al. 1991. The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine* 324:377–384.
- Leapfrog Group. 2002. *Patient safety survey results summary*. Washington, D.C.: The Leapfrog Group, www.leapfroggroup.org.
- Legler, J., H. I. Meissner, C. Coyne, et al. 2002. The effectiveness of interventions to promote mammography among women with historically lower rates of screening. *Cancer Epidemiology Biomarkers & Prevention* 11:59–71.
- Lesar, T. S., B. M. Lomaestro, and H. Pohl. 1997. Medication-prescribing errors in a teaching hospital: A 9-year experience. *Archives of Internal Medicine* 157:1569–1576.
- Levit K., C. Smith, C. Cowan, et al. 2002. Inflation spurs health spending in 2000. *Health Affairs* 21(1):172–181.
- Linder, J. A., and R. S. Stafford. 2001. Antibiotic treatment of adults with sore throat by community primary care physicians: A national survey, 1989–1999. *Journal of the American Medical Association* 286:1181–1186.
- Lindley, C., M. Tully, V. Parmasothy, et al. 1992. Inappropriate medication is a major cause of adverse drug reactions in elderly patients. *Age and Ageing* 21:294–300.

- MacKay, A. P., L. A. Fingerhut, and C. R. Duran. 2000. *Health, United States, 2000*. Hyattsville, Md.: National Center for Health Statistics.
- Marciniak, T. A., E. F. Ellerbeck, M. J. Radford, et al. 1998. Improving the quality of care for Medicare patients with acute myocardial infarction: Results from the Cooperative Cardiovascular Project. *Journal of the American Medical Association* 279:1351–1357.
- Marshall, C. L., M. Bluestein, E. Briere, et al. 2000. Improving outpatient diabetes management through a collaboration of six competing, capitated Medicare managed care plans. *American Journal of Medical Quality* 15(2):65–71.
- Marshall, M., P. Shekelle, S. Leatherman, et al. 2000. What do we expect to gain from the public release of performance data? A review of the evidence. *Journal of the American Medical Association* 283:1866–1874.
- Massachusetts General Hospital (MGH). 1998. *Warfarin continues to be underused as stroke preventive* (press release). Boston: Massachusetts General Hospital, 8 April.
- McGlynn, E. A., and R. H. Brook. 2001. Evaluating the quality of care. In *Changing the U.S. health care system*, edited by R. M. Andersen, T. H. Rice, and G. F. Kominski. San Francisco: Jossey-Bass, 161–161; 165–167.
- McGlynn, E. A., E. A. Kerr, C. L. Damberg, et al., eds. 2000. *Quality of care for women: A review of selected clinical conditions and quality indicators*. Santa Monica, Calif.: RAND Health.
- McGovern, P. G., D. R. Jacobs, E. Shahar, et al. 2001. Trends in acute coronary heart disease mortality, morbidity, and medical care from 1985 through 1997: The Minnesota heart survey. *Circulation* 104:19–24.
- McPherson, M., P. Arango, H. B. Fox, et al. 1998. A new definition of children with special health care needs. *Pediatrics* 102:127–140.
- Mechanic, D., D. D. McAlpine, and M. Rosenthal. 2001. Are patients' office visits with physicians getting shorter? *New England Journal of Medicine* 344:198–204.
- Meehan, T. P., M. J. Fine, H. M. Krumholz, et al. 1997. Quality of care, process, and outcomes in elderly patients with pneumonia. *Journal of the American Medical Association* 278:2080–2084.
- Meehan, T. P., S. R. Weingarten, E. S. Holmboe, et al. 2001. A statewide initiative to improve the care of hospitalized pneumonia patients: The Connecticut pneumonia pathway project. *American Journal of Medicine* 111:203–210.
- Meredith, S., P. H. Feldman, D. Frey, et al. 2001. Possible medication errors in home healthcare patients. *Journal of the American Geriatrics Society* 49:719–724.
- Modifi, M., R. G. Rozier, and R. S. King. 2002. Problems with access to dental care for Medicaid-insured children: What caregivers think. *American Journal of Public Health* 92:53–58.
- Mokdad, A. H., E. S. Ford, B. A. Bowman, et al. 2000. Diabetes trends in the U.S.: 1990–1998. *Diabetes Care* 23:1278–1283.
- Mukamel, D. B. 1997. Risk-adjusted outcome measures and quality of care in nursing homes. *Medical Care* 35:367–385.
- National Committee for Quality Assurance (NCQA). 2001a. *The state of managed care quality: 2001*. Washington, D.C.: NCQA.
- National Committee for Quality Assurance (NCQA). 2001b. *National results for selected 2000 HEDIS® and HEDIS/CAHPS® measures: Commercial audit CAHPS® global proportions; commercial child CAHPS® global proportions; Medicaid adult CAHPS® global proportions*. Washington, D.C.: NCQA.
- National Committee for Quality Assurance (NCQA). 2001c. *HEDIS® 2002 Narrative: What's in it and why it matters*. Washington, D.C.: NCQA.
- National Institute of Dental and Craniofacial Research (NIDCR). 2000. *Oral health in America: A report of the Surgeon General*. Rockville, Md.: U.S. Department of Health and Human Services.
- National Journal Poll Track. 2001. Gallup poll conducted 8–11 November, released 26 November. Washington, D.C.: National Journal.
- Newacheck, P. W., M. McManus, H. B. Fox, et al. 2000. Access to health care for children with special health care needs. *Pediatrics* 105:760–766.
- NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health (NewsHour/KFF/HSPH). 2001. *National survey on nursing homes*. Menlo Park, Calif.: The Henry J. Kaiser Family Foundation.

- Niederman, M. S., L. A. Mandell, A. Anzueto, et al.; American Thoracic Society. 2001. Guidelines for the management of adults with community-acquired pneumonia. *American Journal of Respiratory and Critical Care Medicine* 163:1730–1754.
- O'Connor, G. T., S. K. Plume, E. M. Olmstead, et al. 1996. A regional intervention to improve the hospital mortality associated with coronary artery bypass graft surgery. *Journal of the American Medical Association* 275:841–846.
- O'Malley, M. S., J. L. Earp, S. T. Hawley, et al. 2001. The association of race/ethnicity, socioeconomic status, and physician recommendation for mammography: Who gets the message about breast cancer screening? *American Journal of Public Health* 91:49–54.
- Oral Health America. 2002. *Filling the gaps: Oral health in America*. Chicago: Oral Health America.
- Partnership for Prevention (PFP). 2001. *Priorities in prevention: Oral health*. Washington, D.C.: Partnership for Prevention.
- Peterson, E. D., L. K. Shaw, E. R. DeLong, et al. 1997. Racial variation in the use of coronary-revascularization procedures. *New England Journal of Medicine* 336:480–486.
- Phillips, K. A., K. Kerlikowske, L. C. Baker, et al. 1998. Factors associated with women's adherence to mammography screening guidelines. *Health Services Research* 33:29–54.
- President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry. 1998. *Quality first: Better care for all Americans*. Final report to the President of the United States. Washington, D.C.: U.S. Government Printing Office.
- Rogers, W. J., J. G. Canto, C. T. Lambrew, et al. 2000. Temporal trends in the treatment of over 1.5 million patients with myocardial infarction in the U.S. from 1990 through 1999: The National Registry of Myocardial Infarction 1, 2 and 3. *Journal of the American College of Cardiology* 36:2056–63.
- Ryan, T. J., J. L. Anderson, E. M. Antman, et al. 1996. ACC/AHA guidelines for the management of patients with acute myocardial infarction, a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction). *Journal of the American College of Cardiology* 28:1328–1428.
- Ryan, T. J., E. M. Antman, N. H. Brooks, et al. 1999. *ACC/AHA guidelines for the management of patients with acute myocardial infarction: 1999 update*. Bethesda, Md.: American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Acute Myocardial Infarction).
- Scanlon, D. P., C. Darby, E. Rolph, et al. 2001. Use of performance information for quality improvement. *Health Services Research* 36:619–641.
- Schaffer, S. J., S. G. Humiston, L. P. Shone, et al. 2001. Adolescent immunization practices: A national survey of U.S. physicians. *Archives of Pediatric and Adolescent Medicine* 155:566–571.
- Schoenbaum, M., J. Unützer, C. Sherbourne, et al. 2001. Cost-effectiveness of practice-initiated quality improvement for depression: Results of a randomized controlled trial. *Journal of the American Medical Association* 286:1325–1330.
- Schuster, M. A., E. A. McGlynn, and R. H. Brook. 1998. How good is the quality of health care in the United States? *Milbank Quarterly* 76:517–563.
- Sedlis, S. P., V. J. Fisher, D. Tice, et al. 1997. Racial differences in performance of invasive cardiac procedures in a Department of Veterans Affairs Medical Center. *Journal of Clinical Epidemiology* 50:899–901.
- Seppala, H., T. Klaukka, J. Vuopio-Varkila, et al. 1997. The effect of changes in the consumption of macrolide antibiotics on erythromycin resistance in group A streptococci in Finland. *New England Journal of Medicine* 337:441–446.
- Shapiro, M. F., S. C. Morton, D. F. McCaffrey, et al. 1999. Variations in the care of HIV-infected adults in the United States. *Journal of the American Medical Association* 281:2305–2315.
- Smith, J. P., and B. Edmonston. 1997. *The new Americans: Economic, demographic, and fiscal effects of immigration*. Washington, D.C.: National Academy Press.
- Soumerai, S. B., T. J. McLaughlin, D. Spiegelman, et al. 1997. Adverse outcomes of underuse of beta-blockers in elderly survivors of acute myocardial infarction. *Journal of the American Medical Association* 277:115–121.
- Spore, D. L., V. Mor, P. Larrat, et al. 1997. Inappropriate drug prescriptions for elderly residents of board and care facilities. *American Journal of Public Health* 87:404–409.

- Stuck, A. E., M. H. Beers, A. Steiner, et al. 1994. Inappropriate medication use in community-residing older persons. *Archives of Internal Medicine* 154:2195–2200.
- Szilagyi, P. G., C. Bordley, J. C. Vann, et al. 2000. Effect of patient reminder/recall interventions on immunization rates. *Journal of the American Medical Association* 284:1820–1827.
- Thomas, E. J., D. M. Studdert, J. P. Newhouse, et al. 1999. Costs of medical injuries in Utah and Colorado. *Inquiry* 36:255–264.
- Thomas, E. J., D. M. Studdert, H. R. Burstin, et al. 2000. Incidence and types of adverse events and negligent care in Utah and Colorado. *Medical Care* 38:261–271.
- Thorndike, A. N., N. A. Rigotti, R. S. Stafford, et al. 1998. National patterns in the treatment of smokers by physicians. *Journal of the American Medical Association* 279:604–608.
- Thorndike, A. N., T. G. Ferris, R. S. Stafford, et al. 1999. Rates of U.S. physicians counseling adolescents about smoking. *Journal of the National Cancer Institute* 91:1857–1862.
- Tobacman, J. K., P. Lee, B. Zimmerman, H. Kolder, et al. 1996. Assessment of appropriateness of cataract surgery at ten academic medical centers in 1990. *Ophthalmology* 103:207–215.
- U.S. Census Bureau. 2001. *Health insurance coverage: 2000—highlights*. Washington, D.C.: U.S. Census Bureau.
- U.S. Preventive Services Task Force (USPSTF). 1996. *Guide to clinical preventive services*, 2nd edition. Washington, D.C.: U.S. Department of Health and Human Services.
- U.S. Preventive Services Task Force (USPSTF). 2002. *Screening for breast cancer*. Washington, D.C.: Agency for Healthcare Research and Quality.
- U.S. Renal Data System (USRDS). 2001. *USRDS 2001 annual data report*. Bethesda, Md.: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.
- Weech-Maldonado, R., L. S. Morales, K. Spritzer, et al. 2001. Racial and ethnic differences in parents' assessments of pediatric care in Medicaid managed care. *Health Services Research* 36:575–594.
- Wells, K. B., W. Katon, B. Rogers, et al. 1994. Use of minor tranquilizers and antidepressant medications by depressed outpatients: Results from the Medical Outcomes Study. *American Journal of Psychiatry* 151:694–700.
- Wells, K. B., M. Schoenbaum, J. Unützer, et al. 1999. Quality of care for primary care patients with depression in managed care. *Archives of Family Medicine* 8:529–536.
- Wells, K. B., C. Sherbourne, M. Schoenbaum, et al. 2000. Impact of disseminating quality improvement programs for depression in managed primary care: A randomized controlled trial. *Journal of the American Medical Association* 283:212–220.
- Wells, K. B., R. Sturm, C. D. Sherbourne, et al. 1996. *Caring for depression*. Cambridge: Harvard University Press.
- Wennberg, J. E., and M. M. Cooper, eds. 1999. *The Dartmouth atlas of health care in the United States*. Dartmouth Medical School/AHA Press.
- Wennberg, J. E., and A. Gittelsohn. 1973. Small area variations in health care delivery. *Science* 182:1102–1109.
- Wilcox, S. M., D. U. Himmelstein, and S. Woolhandler. 1994. Inappropriate drug prescribing for the community-dwelling elderly. *Journal of the American Medical Association* 272:292–296.
- Winslow, C. M., J. B. Kosecoff, M. Chassin, et al. 1988. The appropriateness of performing coronary artery bypass surgery. *Journal of the American Medical Association* 260:505–509.
- World Health Organization (WHO). 2000. *World health report 2000*. Geneva: World Health Organization.
- World Health Organization (WHO). 2001. *WHO vaccine-preventable disease monitoring system, 2001 global summary*. Geneva: World Health Organization.
- Zhan, C., J. Sangl, A. S. Bierman, et al. 2001. Potentially inappropriate medication use in the community-dwelling elderly. *Journal of the American Medical Association* 286:2823–2829.



The Commonwealth Fund
One East 75th Street
New York, NY 10021-2692

Telephone (212) 606-3800
Facsimile (212) 606-3500
cmwf@cmwf.org
www.cmwf.org

The Commonwealth Fund

The Commonwealth Fund is a private foundation established in 1918 by Anna M. Harkness with the broad charge to enhance the common good. The Fund carries out this mandate by supporting efforts that help people live healthy and productive lives, and by assisting specific groups with serious and neglected problems. The Fund supports independent research on health and social issues and makes grants to improve health care practice and policy.

The Fund's two national program areas are improving health insurance coverage and access to care and improving the quality of health care services. The Fund is dedicated to helping people become more informed about their health care, and improving care for vulnerable populations such as children, elderly people, low-income families, minority Americans, and the uninsured. An international program in health policy is designed to stimulate innovative policies and practices in the United States and other industrialized countries. In its own community, New York City, the Fund makes grants to improve health care and enhance public spaces and services.