



Quality of Health Care for Medicare Beneficiaries: A Chartbook

Focusing on the Elderly Living in the Community

SHEILA LEATHERMAN AND DOUGLAS MCCARTHY

**UNC PROGRAM ON HEALTH OUTCOMES, SCHOOL OF PUBLIC HEALTH
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Cover photo: Andersen Ross / Photodisc Red / Getty Images

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AHRQ = Agency for Healthcare Research and Quality

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Summary and Highlights

We conducted a broad review of recently published studies and reports to present a coherent picture of the quality of health care for elderly Medicare beneficiaries living in the community. We included findings for all Medicare beneficiaries when available data were not limited to the community-dwelling elderly population.

The results, displayed in 60 charts, reveal many signs of progress, especially in areas that have been targeted as national priorities. However, there are also significant gaps and deficiencies in care and wide variation in quality across the country. While Medicare appears to be working well as an insurance program in providing the elderly with access to needed care, there must be increased efforts to assure systematic and predictable improvements in the quality of care.

On the positive side, improvements can be seen in the provision of preventive services such as mammography, in hospital treatment of heart attack, and in outpatient care for chronic conditions such as diabetes. Fewer elderly patients are receiving inappropriate medications and fewer are dying in the hospital after being treated for heart failure, stroke, pneumonia, and other conditions. More seniors have a usual source of care, an important predictor of getting preventive care and having health care needs met.

On the negative side, large gaps need to be addressed in screening for colorectal cancer, treatment for depression, and control of high blood pressure and high cholesterol among the elderly. Potentially preventable hospitalizations have increased for certain conditions, as have recorded rates of adverse events or complications of care in the hospital. Pilot studies suggest that many vulnerable elderly are not receiving care that is important to well-being in later life, such

as screening and treatment for those with urinary incontinence or at risk of falls. Up to half of family members report concerns with the care provided to a relative at the end of life.

Disparities and unjustified variations in care appear to be no less an issue for the elderly, despite near-universal coverage by Medicare. Minority and low-income elders and those without any supplemental insurance coverage are less likely to get recommended preventive care. Minorities, especially blacks, are more likely to experience certain preventable adverse events or complications of care in the hospital. The physicians of elderly black patients are more likely to report barriers to providing high-quality care. The amount of care received at the end of life varies dramatically depending on where one receives it.

The good news is that change is possible with concerted effort. The chartbook highlights eight exemplary quality improvement interventions that offer promising approaches for critical needs, such as reducing repeat hospitalizations for patients with heart failure, supporting spouses caring for patients with Alzheimer's disease, helping frail elderly maintain their independence at home, and providing palliative care at the end of life. The Medicare program has several initiatives under way that hold the promise of encouraging improvements in access to and quality of care. Yet, greater effort is needed to assure that all Medicare beneficiaries consistently receive the best care that the American health care system has to offer and to reliably expand capacity for continually improving quality over time.

Chartbook Highlights: Signs of Progress in Improving Quality

Since 1989, the rate of influenza **vaccination** has doubled and the rate of pneumococcal vaccination has quadrupled among the elderly. However, one-third did not get an annual flu shot in 2003; almost one-half had never received the pneumococcal vaccine (Chart 1:1).

Risk-adjusted **hospital mortality rates** decreased by 10 percent to 31 percent from 1995 to 2002 among Medicare beneficiaries hospitalized for eight conditions and procedures, such as coronary artery bypass surgery. In contrast, risk-adjusted mortality rates measured 30 days after hospitalization worsened from 2000 to 2002 for six of the same eight conditions or procedures (Chart 1:10).

Physicians more often prescribed **anticoagulant medication** to help prevent strokes among their highest risk elderly patients with atrial fibrillation (irregular heart beat), but about one-half of patients still did not receive these potentially life-saving drugs during 1999–2000 (Chart 1:15).

The proportion of seniors who were taking **potentially inappropriate medications** declined by 37 percent from 1996 to 2000 (Chart 2:5). The rate at which seniors were prescribed antibiotics for the common cold decreased 44 percent from 1997–1998 to 2000–2001 (Chart 1:6).

Functional outcomes for patients of Medicare-certified **home health care** agencies improved by 1 to 5 percentage points from 2002 to 2004 across nine indicators of quality (Chart 1:21).

The proportion of Medicare beneficiaries using **hospice care** at the end of life increased by 9 percentage points from 1998 to 2002, and the use of hospice was nearly equalized among all age groups in contrast to a marked age disparity in rates of use in 1998 (Chart 3:6).

More seniors reported that they had a **regular place to go for health care** in 2002 than in 1993, an important determinant of getting recommended preventive care (Chart 3:4).

Beneficiary knowledge about the Medicare program increased from 1998 to 2002, although more than half indicated they didn't have the information they needed in 2002. Only six of 10 calls to the Medicare information line were answered correctly in a 2004 government audit (Chart 4:4).

Compared to privately insured nonelderly adults in 2001, elderly Medicare beneficiaries were more likely to **rate their insurance highly** and to be **satisfied with their care**. Moreover, they were less likely to report problems with coverage and access to care (Chart 4:1).

One study found that after older adults became eligible for Medicare at age 65, preexisting **disparities in screening** were reduced between those who were insured and those who were uninsured before enrolling in Medicare (Chart 5:5).

Looking across **22 indicators of quality of care** for Medicare beneficiaries, performance in the median state improved from 69.5 percent during 1998–1999 to 73.4 percent during 2000–2001 (Chart 1:22).

Chartbook Highlights: Examples of Deficiencies in Quality

In one pilot study, the quality of care delivered to **vulnerable elderly**—those at high risk of declines in health—met expert standards only a little more than half the time. The greatest gaps occurred in the care of geriatric conditions, such as screening and management of falls and urinary incontinence (Chart 1:23).

Among elderly adults in 2000, one-half had not received a **colorectal cancer screening** test as recommended (Chart 1:3). Similarly in 2000, only one-half of elderly women had ever talked to their doctor about osteoporosis (Chart 1:4).

Although hospital treatment of Medicare **pneumonia** patients complied with one of three evidence-based standards 63 percent to 81 percent of the time in 2002, only 30 percent received care consistent with all three recommended care standards (Chart 1:7).

High blood pressure and **high cholesterol** are two major, modifiable risk factors for heart disease. Only one-quarter of elderly adults whom researchers determined had high blood pressure had it under control during 1999–2000 (Chart 1:12). Likewise, only 18 percent of those that researchers determined had high cholesterol had it controlled (Chart 1:13).

Less than one-third of **depressed** elderly patients in one study received potentially effective treatment during 1999–2001 (Chart 1:19). Only 60 percent of Medicare managed care plan members hospitalized for **mental illness** in 2003 received recommended follow-up care within one month of leaving the hospital (Chart 1:20).

From 1995 to 2002, rates of **potentially preventable hospitalizations** among Medicare beneficiaries increased for seven of 12 conditions, such as a 24 percent increase in the rate of hospitalization due to bacterial pneumonia (Chart 1:11).

Risk-adjusted rates of potentially preventable **adverse events or complications of care** increased for nine of 13 indicators from 1995 to 2002, as recorded in hospital billing records for Medicare beneficiaries (Chart 2:2).

About half of Medicare patients undergoing selected surgeries in 2001 did not receive prophylactic antibiotics in a timely manner consistent with evidence about how most effectively to prevent **postoperative infections** (Chart 2:4).

Among those who died of a chronic condition in 2000 and received **care at the end of life**, 15 percent to 50 percent of their family members expressed concerns about some aspects of the care delivered at the end of life (Charts 4:5 to 4:7).

Chartbook Highlights:

Examples of Disparities and Unjustified Variations in Care

Minority elderly patients were more likely than white elderly patients to suffer certain potentially preventable **adverse events or complications of care** among those hospitalized during 2001. For example, black patients were 2.3 times more likely than white patients to suffer a pressure sore during a hospital stay of five days or longer (Chart 5:1).

In national surveys conducted among community-dwelling elderly adults during 1998, 2000, and 2001:

- Minorities were less likely than whites to receive some **preventive services**. For example, Asian Americans were half as likely to have ever received a pneumococcal vaccination as of 2001; Hispanics were almost one-third less likely to have ever received sigmoidoscopy or colonoscopy as of 2000 (Chart 5:2).
- Those with lower income were less likely than those with higher income to receive most preventive services studied. In 2000, for example, only 56 percent of poor elderly women had received a mammogram in the past two years as compared to 83 percent of high-income elderly women (Chart 5:3).
- Seniors with private supplemental coverage (such as retiree coverage or a Medigap plan) were more likely to receive the preventive services studied than were low-income seniors who are dually eligible for Medicare and Medicaid or those seniors without any supplemental coverage (Chart 5:4).

Among Medicare beneficiaries enrolled in managed care plans during 1999, blacks were less likely than whites to receive recommended **chronic care services**, such as beta-blocker medications after a heart attack or blood tests to check on control of diabetes. Hispanics, Asian Americans, and Native Americans were less likely than whites to receive some services but equally or more likely to receive other services or to achieve good outcomes (Chart 5:6).

The amount of care provided to **chronically ill Medicare beneficiaries during the last six months of their lives** varied greatly (three-fold to 14-fold difference in rates from highest to lowest) among 77 hospitals during 1999–2000, suggesting that where one receives care—rather than individual medical need—determines the amount of care that is provided (Chart 5:8).

States with higher spending per Medicare beneficiary tended to rank lower on **22 quality of care indicators**. This inverse relationship might reflect medical practice patterns that favor intensive, costly care rather than the effective care measured by these indicators (Chart 5:9).

During 2000–2001, physicians visited predominantly by black Medicare patients were less likely than physicians visited predominantly by white Medicare patients to report that they can deliver and **obtain access to high-quality care** for their patients (Chart 5:10).

Chartbook Highlights:

Eight Exemplary Interventions to Improve Quality of Care for Medicare Beneficiaries

An **educational intervention for internal medicine physicians** at a teaching hospital resulted in a 72 percentage point improvement in the proportion of elderly pneumonia patients screened to determine whether they needed the pneumococcal vaccine and a 34 percentage point increase in those given the vaccine when needed (Chart 6:1).

Medicare patients at 10 southeastern Michigan hospitals were more likely to receive evidence-based treatment when caregivers used **customized, guideline-oriented tools**, such as standard admission orders, clinical pathways, and standard discharge forms, as part of a structured intervention to improve heart attack treatment (Chart 6:2).

Hospital readmissions were reduced by 36 percent when elderly patients with heart failure received **individualized transitional care from an advanced practice nurse** who provided needs assessment, care planning, patient education, and therapeutic support through discharge planning and home follow-up visits. Implementing such a program nationally for all Medicare beneficiaries could prevent up to 84,000 hospital readmissions each year (Chart 6:3).

Older adults with depression were more likely to receive treatment and to achieve better outcomes when a **trained nurse or psychologist collaborated with the patient and primary care physician** to support medication management and/or provide brief psychotherapy under supervision of a psychiatrist and primary care expert (Chart 6:4).

Family members who care for a relative with Alzheimer's disease often experience psychological distress. **Providing spouse-caregivers with intensive counseling and ongoing support** reduced their burden of depression compared to the burden in a control group. Alzheimer's patients whose spouses received enhanced services were cared for at home nearly a year longer before being institutionalized (Chart 6:5).

The hospitalization rate fell by 22 percent over three years among home health care agencies that used regular reports on their patients' outcomes to plan and make improvements in care as part of a national demonstration program (Chart 6:6).

PACE (Program of All-Inclusive Care for the Elderly) serves frail elders eligible for Medicare and Medicaid who are at risk of nursing home placement. An **interdisciplinary team based at an adult day care center** provides health care and supportive services. Participants enrolled in PACE demonstrations in 11 cities spent fewer days in a hospital or nursing home, had equal or better outcomes, were less likely to die during the demonstration, and had lower Medicare costs per participant than those in a comparison group (Chart 6:7).

Some people with life-threatening chronic illnesses do not qualify for hospice care because of uncertain prognosis or because they wish to continue receiving some curative care. **A palliative care program that allowed participants to receive gradually more supportive services at home** enabled more of them to die at home, with increased satisfaction and at lower cost than for a comparison group (Chart 6:8).

Introduction

The federal government's financial responsibility to provide access to health care for the nation's 41 million Medicare beneficiaries implies a concomitant obligation to assure that funds spent on behalf of taxpayers achieve the overarching goals of the health care system: "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). These goals are realized more specifically by assuring that the \$280 billion spent for Medicare health care services are delivered to beneficiaries in a safe, effective, timely, patient-centered, equitable, and efficient manner.

The Medicare program has taken great strides in its capacity to influence the quality of health care since Congress first created the Professional Standards Review Organizations in 1972. The Institute of Medicine's landmark 1990 report on quality assurance in Medicare (IOM 1990) was instrumental in shifting the focus from retrospective case review to a more systematic and proactive approach. Medicare launched its Health Care Quality Improvement Program in the 1990s to promote the wider adoption of professionally developed, evidence-based standards of care. The Peer Review Organizations have been renamed Quality Improvement Organizations (QIOs) and tasked to work cooperatively with local health care providers on statewide quality improvement projects that will advance the national Medicare quality agenda (Sprague 2002).

These efforts have taken on greater urgency since a series of recent Institute of Medicine reports characterized pervasive

problems in health care quality in the United States as a "chasm," requiring new approaches to quality improvement at both the local and national levels (IOM 2001a, 2004). The IOM envisioned a redesign of local health care delivery systems accompanied by new policies to promote high-quality health care through regulatory and payment incentives and the application of health information technologies that can positively influence the way in which physicians and organizations work.

Quality of Health Care for Medicare Beneficiaries is the third in a series of chartbooks intended to help achieve these goals by providing a common understanding of the magnitude and scope of quality problems among the many stakeholders interested in improving the performance of the American health care system. It presents 60 charts portraying the state of health care quality in the Medicare program, focusing primarily on quality of care delivered to the 35 million elderly beneficiaries (ages 65 and older) living in the community who constitute the great majority of the Medicare program.* The final section profiles some examples of promising quality improvement initiatives to illustrate that significant change is indeed possible, even if often difficult to replicate and sustain.

* This chartbook does not address specific quality of care issues for disabled Medicare beneficiaries, patients in the Medicare End Stage Renal Disease program, or elderly nursing home residents. These population groups have special needs and concerns that deserve attention for quality measurement and improvement, but which we were unable to include within the necessarily limited scope of this project. These individuals, however, are included in data depicting quality of care for Medicare beneficiaries in general (see Table of Charts).

OVERVIEW: PROGRESS, GAPS, AND VARIATIONS

Like its predecessors, this chartbook presents examples both of progress in improving health care quality and of deficiencies that point to the need for further action (see *Summary and Highlights*). Most indicators that have been measured over time show movement in the right direction, with some notable exceptions, such as increasing rates of potentially preventable hospitalizations and adverse events. The pace of change is often slow, however, and appears to have reached a plateau in some areas, such as adult immunizations. Although improvements offer inspiration and potential lessons for application to other areas, large gaps from optimal care remain in too many areas. Even where a relatively high level of quality has been achieved, constant effort will be needed, as new medical therapies and health care approaches are developed and proven, to continuously incorporate the best standards and clinical practices into health care delivery.

Underuse

In contrast to the Institute of Medicine's 1990 report, which found the problem of underuse hard to document, quality measurement systems have advanced to the point that we now have many good examples of *the failure to provide services based on scientific evidence to all who could benefit* (IOM 2001b). Average performance is approaching the 75 percent range on widely accepted standards of care represented in the Medicare Quality Improvement Organization program (Jencks et al. 2003) (see Chart 1:22 and Appendix Table 1). However, variation in performance on measures of clinical effectiveness represented in this chartbook is quite wide, ranging from 10 percent to 90 percent of optimal care. Moreover, smaller studies that focus on geriatric needs and conditions find that

little more than half of vulnerable elders receive the care that experts believe is important to the elderly (Wenger et al. 2003) (see Chart 1:23).

Overuse

Researchers at RAND published a series of studies documenting that about one-third of surgical procedures were performed for inappropriate reasons or had questionable benefits for Medicare beneficiaries during the 1980s and early 1990s (McGlynn and Brook 2001). The need to *refrain from providing services to those not likely to benefit* (IOM 2001b) is now receiving renewed attention as concerns about the affordability and safety of health care are increasingly acknowledged. One of the few indicators of overuse in this chartbook suggests limited improvement in that the elderly are less often receiving antibiotics for the common cold. Several charts in the Capacity to Improve section illustrate care management approaches that reduce costs and risk to patients through the avoidance of hospital admissions and nursing home stays.

Misuse

The Institute of Medicine's 1999 report, *To Err is Human*, galvanized national attention to this area of quality, defined as *avoidable complications of appropriate health care* (Chassin 1991). New measures and sources of data, such as the Patient Safety Indicators developed by the Agency for Healthcare Research and Quality and the Medicare Patient Safety Monitoring System, are providing useful data to study this problem. The major challenge lies in identifying the underlying causes behind misuse and actions that can be taken to prevent adverse events and harm to patients.

Variations in use

The data presented in the chartbook suggest that variations and disparities in care are wider for services that are relatively new or are generally underused. This variation may lessen over time as the specific health care services become more widely used and accepted generally.

By patient age: The clinical quality and outcomes of health care for the elderly are sometimes similar to that of nonelderly adults but also varies in both directions—better and worse. For both elderly and nonelderly, however, quality is typically far from optimal. These variations must be interpreted in the context of characteristics of the elderly population (see next section for further discussion). The elderly generally experience more adverse events or complications of care, for example, in part because of their more vulnerable physical condition. By contrast, elderly Medicare beneficiaries generally report fewer problems with their coverage and access to care and they give higher ratings to their health plan and the patient-centeredness of their care than nonelderly adults.

By type of coverage: Although Medicare beneficiaries with supplemental coverage are more likely to receive high-quality care, Medicare as a whole offers important advantages in meeting the health care needs and expectations of the elderly across all types of coverage. Comparisons by type of coverage must be interpreted with caution, because those who are on Medicaid or who do not have supplemental coverage generally have lower incomes than those with private supplemental coverage, and low income is an independent risk factor for access barriers.

By race, ethnicity, and income: Racial and ethnicity disparities in care are pervasive but not monolithic or consistent from condition to condition or from measure to measure. This suggests that the determinants of disparities—and by implication the actions likely to reverse disparities—are specific to the particular context, although some factors are undoubtedly correlated across conditions. Socioeconomic factors may have a larger influence on disparities in the receipt of preventive care than race or ethnicity alone.

By geography: State-level variations in compliance with standards for preventive care can be wide. Variations appear to be narrower for measures, such as mammography, with higher overall compliance than for measures with lower overall rates, such as colorectal cancer screening. Comparing state quality performance to Medicare spending suggests that high-quality health care need not cost more, at least as measured by these indicators (see Chart 5:9). The relationship between quality and cost is complex and likely to be influenced by structural factors such as physician supply (Baicker and Chandra 2004).

A growing body of research is finding that racial and ethnic disparities nationally can be attributed in part to geographic variations in care because minorities tend to live in areas with lower overall use of particular services (Skinner et al. 2003; Groeneveld et al. 2005). Hence, eliminating disparities cannot depend solely on equalizing care locally. Rather, it requires achieving the appropriate amount of care for everyone in similar need, regardless of where they live.

CHALLENGES IN MEASURING QUALITY FOR THE ELDERLY POPULATION

The elderly have different population health characteristics and make more intensive use of health care compared to the general population—factors that call for special attention in understanding health care quality and how to improve it for the elderly (Reuben et al. 2003a). Although the burden of disease generally increases and health status generally declines with age, the elderly are not a homogenous group. Many elderly individuals remain in relatively good health; others suffer various degrees of functional impairment or disability (Kane et al. 2004). This heterogeneity calls for individualized approaches to health maintenance and treatment that can challenge quality measurement to account for justifiable variations in care.

Two-thirds (65%) of the elderly have multiple chronic conditions (Wolff et al. 2002). Appropriate care for these individuals represents one of the more pressing challenges for clinical practice and quality measurement. Evidence-based standards of care captured in guidelines and quality measures (and in many of the charts shown in this chartbook) focus on single diseases as if these were treated in isolation. Yet, medications that are known to be effective to treat specific diseases may be less beneficial in combinations that increase risks for poor adherence, side effects, and drug-drug interactions. These concerns “raise the question of whether what is good for the disease is always best for the patient” (Tinetti et al. 2004).

The elderly—and especially the oldest old—are often in a situation analogous to that of children in that physicians must

extrapolate the likely benefits of treatment from studies done in a general population of healthy adults. In some cases, a lower amount of care might not represent poor quality when evidence or consensus is lacking on the efficacy of treatment or when patients and their physicians might decide that the potential risks of treatment outweigh the potential benefits in particular circumstances. Yet, one cannot assume that well-informed decision-making is universally practiced and entirely accountable for gaps in compliance to guidelines.

The population data used for many charts do not permit one to determine the appropriateness of care or to report rates in accordance with evidence about the ages for which care is known to be effective. Even where data are reported by age ranges, interpreting the appropriateness of a service may be difficult without additional information. For example, information on health status is needed to estimate life expectancy and the likely benefit of mammography among women ages 75 and older (see narrative accompanying Chart 1:2 for further discussion). Hence, this chartbook should be considered a preliminary approach at examining many topics. More detailed research would be helpful to examine quality for particular conditions in more depth.

THE CHALLENGE AHEAD: IMPROVING QUALITY OF CARE FOR THE ELDERLY

The elderly population is expected to double in size in the next 25 years, from 35 million today to 71 million people ages 65 and older by the year 2030 (CDC 2003c). The impending retirement of the baby boomer generation represents both a challenge for the financing of Medicare and an opportunity to consider the

most effective way to organize and deliver health care for the elderly. Many experts have noted that the unique and growing needs of the elderly population demand improved training in the principles of geriatric medicine for the nation's health professionals (Hudson 2003; LaMascus et al. 2005).

Many Medicare beneficiaries have limited incomes, decreased mobility, low health literacy, and impaired ability to use the telephone (Williams 2004). The elderly are less likely than younger adults to use the Internet. They often need help to manage complex medication regimens and navigate the health care system. These individual challenges in combination with the fragmented structure of a health care system that is focused on acute care services may create formidable barriers to accessing and realizing the benefits of appropriate care for the elderly.

Systemic improvement in quality of care for the elderly as for other populations calls for an integrated strategy. The essential elements of such a strategy include setting national priorities, defining targets for achievement, providing support through investment in information technology, and paying for and monitoring performance (Leatherman and Sutherland 2003). Although the examples in the final section of the chartbook provide inspiration that improvement is possible in particular settings, achieving any measurable impact on the health care and health of the elderly requires wider adoption of these kinds of interventions.

The Medicare program has several promising changes under way or forthcoming that may help realize these improvement goals. They include:

- a new prescription drug benefit and expanded coverage for certain preventive care services;

- systematic evidence reviews for conditions affecting Medicare beneficiaries;
- public reporting of performance information on health plans, hospitals, kidney dialysis facilities, and home health agencies; and
- demonstration programs for chronic disease management, cancer prevention and treatment among ethnic and racial minorities, information technology in doctors' offices, and pay for performance.

These efforts must be rigorously evaluated to learn whether they are effective in meeting goals and how they might be improved over time to best meet the needs of Medicare beneficiaries.

CONCLUSION

As the country's only national social health insurance program, Medicare offers a reasonable model for the future of health care coverage in America. The evidence that the elderly are more likely to have their health care needs met and experience fewer problems with their insurance and health care than nonelderly adults is a testimony to Medicare's success in achieving its founding goals. As an increasing proportion of the nation's economy is devoted to health care in the coming years, with an increasing proportion paid for by the federal government, understanding the factors behind Medicare's success and building on them to strengthen the Medicare program for the future is crucial.

Methods

The charts selected for this chartbook are intended to represent a coherent sample of the best available published data in terms of relevance to policy, generalizability to important segments of the population, scientific soundness of measures, balance in depicting various aspects of quality, and feasibility for presentation in chart format. Our process was as follows:

We reviewed the general literature on quality of care for Medicare beneficiaries and solicited feedback of expert advisors on the project definition and scope.

We conducted a literature review using PubMed and other searches to identify potential studies of interest, focusing on data published since our first chartbook in 2002.

From about 400 studies identified, we selected a subset that we judged most relevant and feasible for presentation. Our expert consultants and advisors prioritized this list based on the criteria described above and we made other adjustments based on considerations of balance.

The final group of charts and narrative was reviewed by the members of the Chartbook Advisory Board, project consultants, and staff at The Commonwealth Fund, who suggested several additions and improvements.

We preferred studies using recent and nationally representative data. Other strong data were considered when no national data were available to depict an important topic. Because we were limited by the availability of published data to depict quality for seniors, the topics included in the chartbook should not be considered an ideal quality measurement set.

We did not directly compare clinical quality of care between the Medicare fee-for-service program and Medicare managed care plans, other than to report the rate of influenza vaccination from the CAHPS (Consumer Assessment of Health Plans Study) survey. Definitions and/or data sources used by the Centers for Medicare and Medicaid Services (CMS) to measure clinical quality for Medicare fee-for-service beneficiaries are not fully equivalent to the HEDIS measures and/or data sources used by the National Committee for Quality Assurance to report on quality of care for managed care plans. For example, CMS diabetes measures are based on administrative claims data while HEDIS uses a hybrid of administrative data and medical records that produces a more accurate but higher rate than administrative data alone. Work should be undertaken to define and report on comparable measures. In the meantime, CAHPS provides the fairest direct comparisons between Medicare fee-for-service and Medicare managed care based on beneficiary perceptions (see Chart 4:2).

We generally discuss differences in rates only when they are statistically significant (i.e., 95 percent confidence or greater that differences are not due to random chance), where significance has been reported or can be inferred based on large sample size. We use the term “significant” only in this context. In other cases, we describe what we considered to be meaningful differences. Percentages and rates generally are rounded to the nearest whole number, except where rounding would mask significant or potentially meaningful differences.

See the Technical Appendix for details on study methodologies.

Terminology

Elderly, elders, and seniors are used interchangeably to refer to adults ages 65 and older. We recognize that some people prefer to use the term “older adults” for this population but we found that this term could be confusing to some readers.

Vulnerable elderly are a subset of the elderly at greater risk for declines in health.

Near-elderly is used in the way that was intended by the research being cited. In some cases, this term refers to adults ages 55 to 64 and in other cases it means adults ages 60 to 64.

Middle-age generally refers to adults ages 45 to 64, an age category frequently used for reporting on national survey data, but it also refers to adults ages 50 to 64 in some contexts such as when describing colorectal cancer screening.

The terms **health professional, clinician, and practitioner** refer to individuals including physicians, nurses and nurse practitioners, and physician’s assistants. We generally reserve the use of the term health care provider to encompass a broader category including both individual professionals and institutions such as hospitals.

Race and ethnicity are reported generally following the terminology (e.g., black or African American) used in the original survey or article. For this reason, the usage may appear inconsistent from chart to chart.

Several different populations are described in the chartbook:

Medicare beneficiaries include those living in the community or in institutions such as nursing homes. Age-specific data were available for elderly Medicare beneficiaries only for selected conditions, such as hospital treatment of heart attack. When care for the elderly did not differ substantially from nonelderly beneficiaries, such as for hospital treatment of pneumonia, we reported overall results.

Medicare fee-for-service beneficiaries include all those who have their health care bills paid by Medicare’s traditional (original) Medicare fee-for-service program.

Community-dwelling adults are civilian, noninstitutionalized individuals, including a small number who are not Medicare beneficiaries. We often used data from national surveys of community-dwelling adults (rather than Medicare-specific data sources) to compare services received for both elderly and nonelderly adults. Most age-specific comparisons focus on middle-age adults (rather than younger adults) because their health care needs are more like those of the elderly.

Medicare managed care plan members are beneficiaries who have joined private plans (primarily health maintenance organizations) that contract with the federal government to provide Medicare-covered services. These plans were called Medicare+Choice plans but are now called Medicare Advantage plans.



SECTION 1

Effectiveness

Effectiveness means “providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse).” – Institute of Medicine 2001a

EFFECTIVENESS • STAYING HEALTHY • CHART 1:1

Immunization of Elderly Adults

Why is this important? Influenza and pneumonia are the fifth leading cause of death among adults ages 65 and older in the United States (NCHS 2004a). Within this age group, complications from influenza lead to 32,000 deaths annually (Thompson et al. 2003) and severe pneumococcal infections (bacteremia and meningitis) account for an additional 3,400 deaths each year (Robinson et al. 2001). The Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices recommends that adults ages 65 years and older receive an annual influenza vaccination and a single pneumococcal vaccination, which can prevent many hospitalizations and premature deaths (CDC 1997, 2000; Harper et al. 2004). Medicare has paid for pneumococcal vaccination of Medicare beneficiaries since 1981 and for influenza vaccination since 1993 (GAO 2002a).

Findings: From 1989 to 2003, the proportion of community-dwelling Americans ages 65 and older who reported receiving an influenza vaccination in the past year more than doubled, from 31 percent to 66 percent, while the proportion who reported ever receiving a pneumococcal vaccination quadrupled, from 14 percent to 56 percent (NCHS 2004a). There has been little or no substantial increase in the past few years, however. Minnesota achieved adult vaccination rates of 80 percent for influenza and 73 percent for pneumococcal disease, the best performance for any state in 2003 (CDC 2004a).

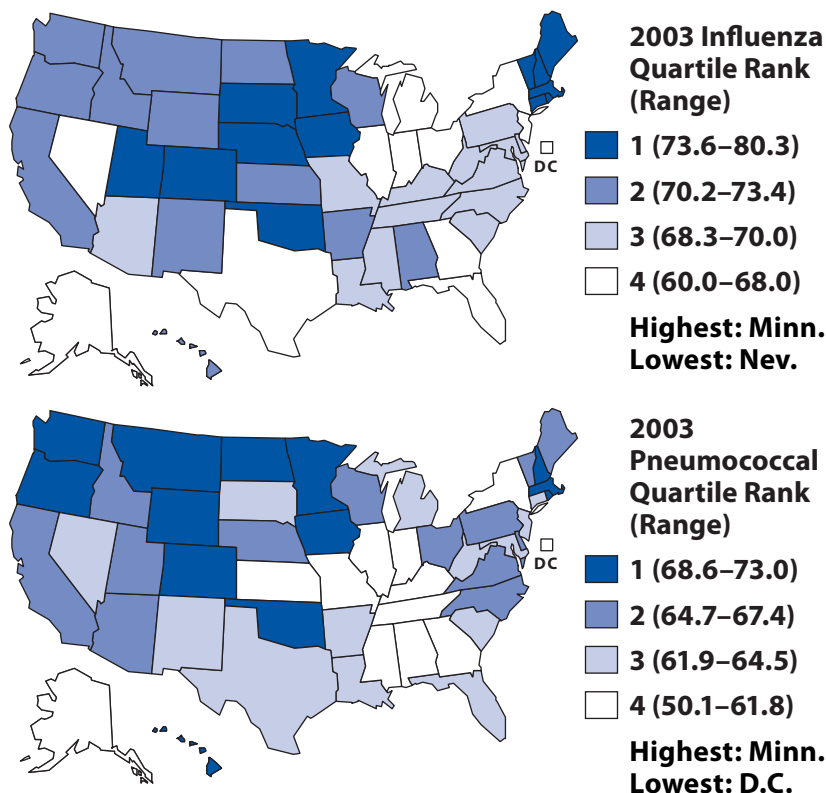
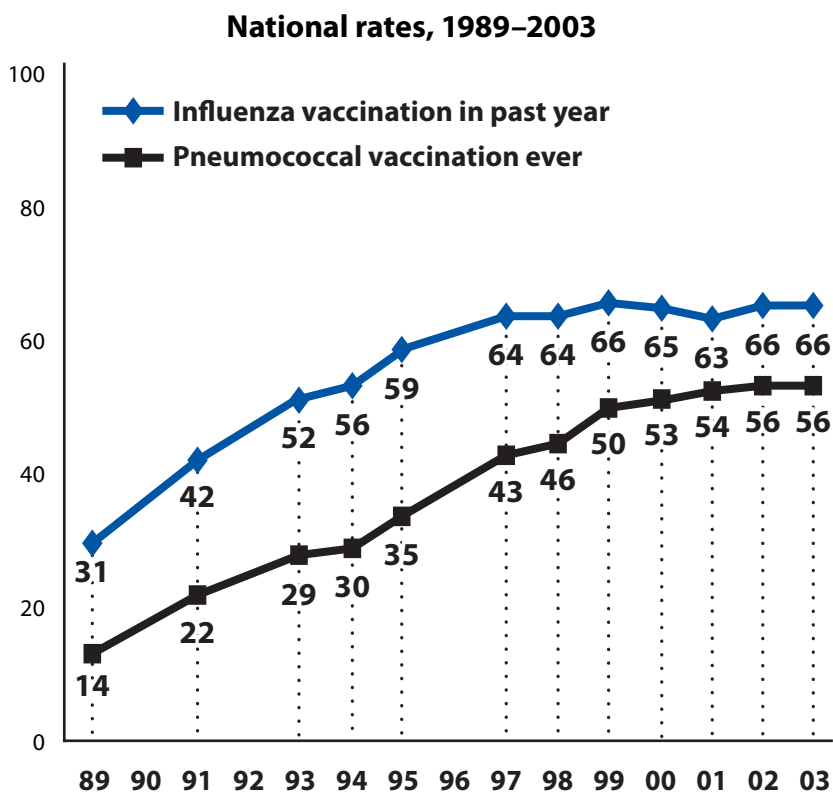
Implications: The nation remains far from the Healthy People 2010 goal of 90 percent coverage for these vaccines, even in the best-performing state. Common reasons that seniors give for not getting vaccinated include not knowing the vaccines are needed, fearing that the vaccine will cause infection or side effects, not believing that the vaccine will be effective, and simply forgetting about it (CDC 1999, 2004b). A delay in vaccine supply was a factor in lower vaccination rates during the 2000–2001 flu season. The vaccine shortage during 2004–2005 highlights the need for a national strategy to assure adequate vaccine supply (GAO 2004b).

The most effective interventions for increasing adult vaccination and other preventive care services involve organizational changes, such as offering prevention clinics and planned preventive care visits, engaging in quality-improvement activities, and designating nonphysician staff to perform prevention activities. Education and reminders for health care providers and patients also can be effective (Stone et al. 2002).

Immunization of Elderly Adults

The rate of influenza vaccination doubled and the rate of pneumococcal vaccination quadrupled among the elderly from 1989 to 1999, but rates have not increased proportionally since then. One-third to one-half of elderly adults were not immunized as recommended in 2003. The higher rates achieved in states such as Minnesota demonstrate that substantial improvement is possible assuming adequate vaccine supply.

Percentage of community-dwelling U.S. adults ages 65+ who reported receiving recommended vaccinations



Sources: National rates—National Health Interview Survey (NCHS 2004a).
 State rates—Behavioral Risk Factor Surveillance System (CDC 2004a).
 National and state rates are not comparable because of differences in survey methods.



EFFECTIVENESS • STAYING HEALTHY • CHART 1:2

Breast Cancer Screening

Why is this important? Breast cancer is the most prevalent non-skin cancer among U.S. women, with 212,000 new cases and 40,000 deaths annually (Jemal et al. 2004). Breast cancer victims lose 19 years of life on average (Brown et al. 2001). Mammography—a low-dose X-ray of the breast that can detect breast cancer at its earliest and most treatable stage—reduces the risk of death from breast cancer by 23 percent in women ages 50 and older (USPSTF 2002a). Although evidence is strongest for screening women ages 50 to 69, one randomized controlled trial that included women ages 70 to 74 reported benefit for this age group (Humphrey et al. 2002). Women ages 75 and older are likely to benefit from screening and early detection if their life expectancy is not compromised by comorbid illness. Medicare has paid for screening mammography since 1991, subject to a 20 percent patient copayment for physician services (GAO 2002a).

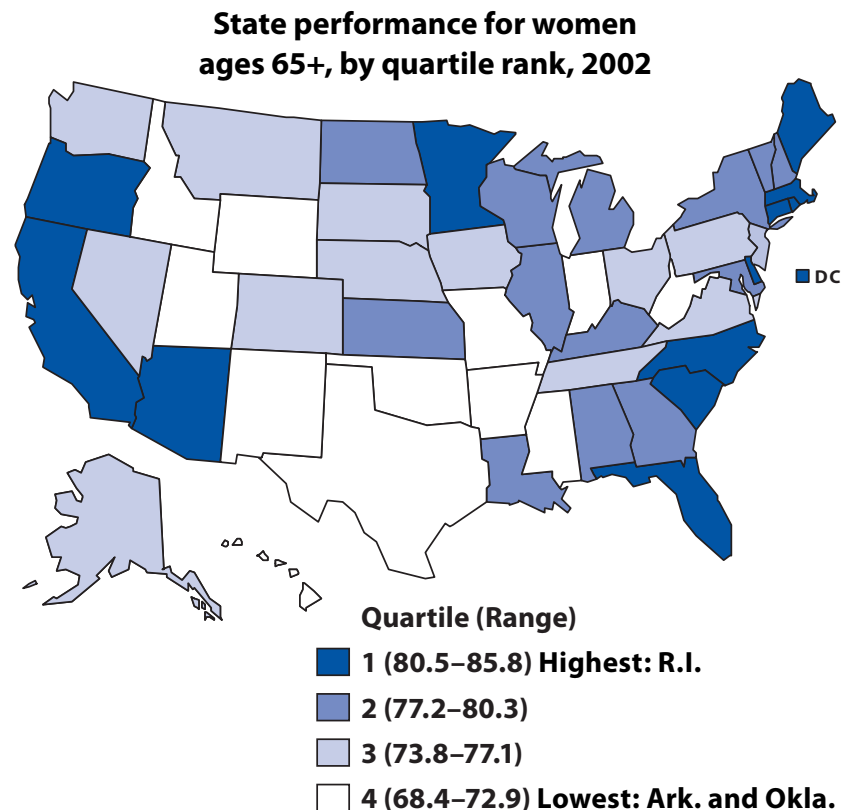
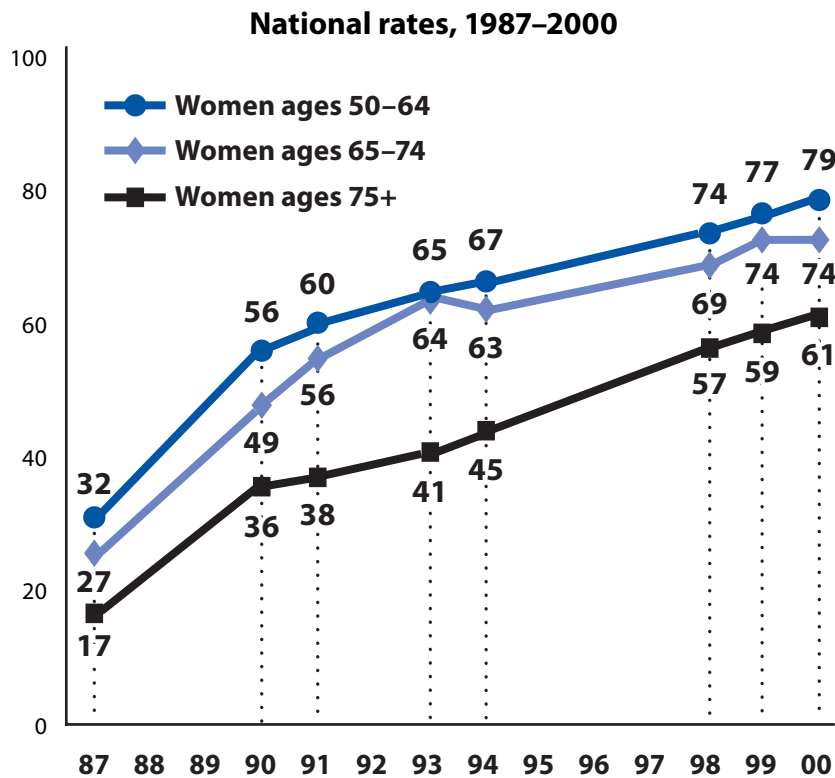
Findings: The proportion of community-dwelling women ages 65 and older who reported having a mammogram in the past two years tripled from 1987 to 2000. The rate for women ages 65 to 74 increased from 27 percent to 74 percent, while the rate for those ages 75 and older increased from 17 percent to 61 percent. This trend was similar to that among women ages 50 to 64, who are screened at a higher rate (NCHS 2004a). In 2002, screening rates among women ages 65 and older varied from a high of 86 percent in Rhode Island to a low of 68 percent in Arkansas and Oklahoma (CDC/MIAH 2004).

Implications: A lower rate of screening among older women might be appropriate if it reflected patient preferences based on individualized assessment of potential benefits and harms. Yet, older women are less likely than younger women to actively participate with their physician in the decision to be screened (Burack et al. 2000). Moreover, mammography use decreases by age independent of self-reported health status and disease burden (Blustein and Weiss 1998; Burack et al. 1998). A recent survey in California found that women ages 80 to 85 in the best health were less likely to be screened than women ages 75 to 79 in the worst health, even though the former group were more likely to benefit from mammography (Walter et al. 2004). These findings indicate that better tools are needed to promote more informed decision-making about breast cancer screening among older women (Walter and Covinsky 2001).

Breast Cancer Screening

The proportion of elderly women who reported having a recent mammogram tripled over the past decade. Although evidence is strongest for screening women ages 50 to 69, screening is likely to be beneficial for older women with life expectancies of five years or longer. Screening rates for elderly women varied among the states by 17 percentage points from lowest to highest.

Percentage of community-dwelling U.S. women who reported having a mammogram in the past 2 years



Sources: National rates — National Health Interview Survey (NCHS 2004a).
 State rates — Behavioral Risk Factor Surveillance System (CDC/MIAH 2004).
 National and state rates are not comparable because of differences in survey methods.



EFFECTIVENESS • STAYING HEALTHY • CHART 1:3

Colorectal Cancer Screening

Why is this important? Colorectal (colon or rectum) cancer is the second most frequent cause of cancer death, claiming 56,000 lives annually and reducing lifespan by 13 years on average (Ries et al. 2000; Jemal et al. 2004). The U.S. Preventive Services Task Force and other medical societies recommend regular screening for colorectal cancer among adults ages 50 and older to detect polyps or cancers at an earlier and more treatable stage (Pignone et al. 2002; USPSTF 2002b; Winawer et al. 2003). Screening options include the following:

- fecal occult blood test (done at home to detect blood in the stool) every year, and/or sigmoidoscopy (in which the doctor inserts a flexible, lighted tube to visually inspect the rectum and lower large intestine) every five years, or
- total colon examination by colonoscopy (in which the doctor inserts a flexible, lighted tube to visually inspect the rectum and entire large intestine) every 10 years, or by double-contrast barium enema (which is an x-ray examination of the rectum and entire large intestine) every five years.

Findings: In 2000, only one-half of community-dwelling adults ages 65 and older reported performing a blood stool test at home in the past year or receiving a colorectal endoscopy test (including sigmoidoscopy or colonoscopy) in the past 10 years. Results were similar for endoscopy testing in the past five years (the survey did not ask about double-contrast barium enema). Screening was somewhat

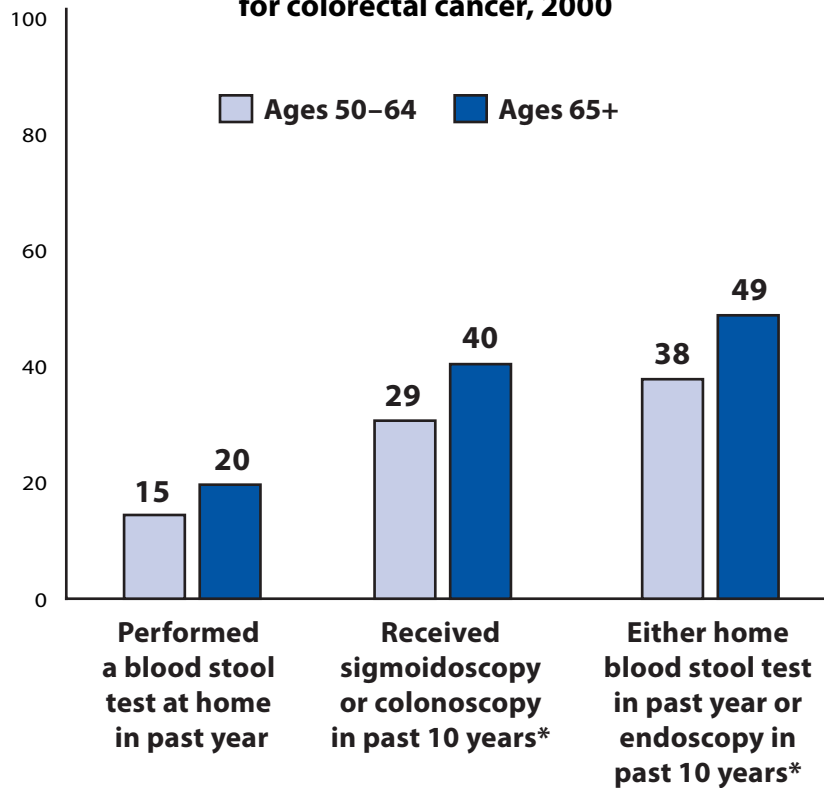
higher among the elderly than middle-age adults (Seeff et al. 2004). Among the states, the proportion of seniors who reported ever receiving a sigmoidoscopy or colonoscopy ranged from 47 percent in Nebraska to 75 percent in Minnesota in 2002 (CDC/MIAH 2004).

Implications: Although colorectal cancer screening has nearly doubled compared to rates reported for 1992 (Nadel et al. 2002), it remains widely underused. For example, men are more likely to be screened for prostate cancer than colorectal cancer, despite the proven benefit of colorectal cancer screening and the uncertain benefit of prostate cancer screening (Sirovich et al. 2003). The most common reasons cited for not receiving colorectal cancer screening indicated lack of awareness (“didn’t think of it,” cited by one-half of those not screened) and lack of a physician recommendation (cited by about one-quarter) (Seeff et al. 2004). Medicare began paying for these tests for screening purposes in 1998; sigmoidoscopy and colonoscopy are subject to a copayment and the Medicare Part B deductible (GAO 2002a).

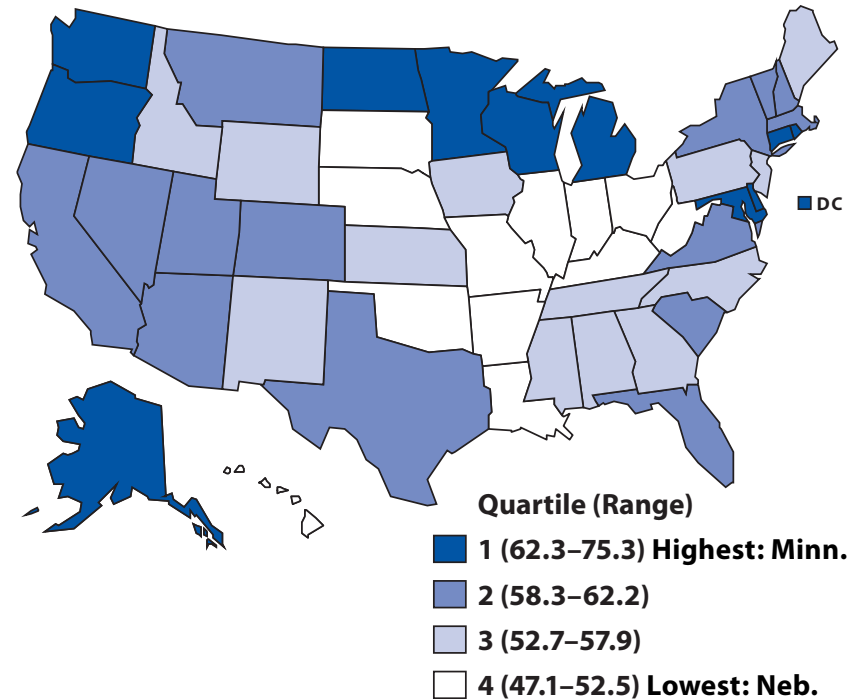
Colorectal Cancer Screening

Elderly adults are more likely than middle-age adults to receive colorectal cancer screening tests, but one-half had not been screened as recommended in 2000. The proportion of seniors who had ever received sigmoidoscopy or colonoscopy varied among the states by 28 percentage points from lowest to highest in 2002.

Percentage of community-dwelling U.S. adults who reported receiving a test for colorectal cancer, 2000



State performance for percentage of community-dwelling elderly adults ages 65+ who reported ever receiving sigmoidoscopy or colonoscopy, by quartile ranks, 2002



Source: National rates — National Health Interview Survey (Seeff et al. 2004).

State rates — Behavioral Risk Factor Surveillance System (CDC/MIAH 2004).

National and state rates are not comparable because of differences in measures and survey methods. *The national survey asked about most recent receipt of proctoscopy, sigmoidoscopy, or colonoscopy; the recommended time interval for colonoscopy is used but results were similar for a five-year interval.



EFFECTIVENESS • STAYING HEALTHY • CHART 1:4 (EMERGING ISSUE)

Osteoporosis Counseling and Screening

Why is this important? An estimated 10 million Americans have osteoporosis (“porous bone”), four of five of them women, and another 34 million have low bone mass that puts them at risk of developing this skeletal disorder. Osteoporosis leads to bone fragility and an estimated 1.5 million fractures each year. Risk of osteoporosis increases with age. Among those ages 50 and older, half of women and one-quarter of men will have an osteoporosis-related fracture during their lifetime, including vertebral deformities that can lead to chronic pain and hip fractures that increase the risk for nursing home admission and death (DHHS 2004; NIH 2004; NOF 2004).

Physician counseling on osteoporosis should emphasize preventive measures for bone loss, including weight-bearing exercise, adequate dietary intake of calcium and Vitamin D, strategies to prevent falls, and avoidance of tobacco and excessive alcohol use (NOF 1999, 2003). Osteoporosis screening became a Medicare-covered benefit in 1998, when the National Osteoporosis Foundation and other medical societies recommended that all women ages 65 and older, and younger post-menopausal women with a fracture or risk factors, have bone density measurement for osteoporosis. The U.S. Preventive Services Task Force made a similar recommendation in 2002. Those diagnosed with osteoporosis can be treated with medications that improve bone density and reduce the risk for fracture (USPSTF 2002d).

Findings: One-half of elderly female Medicare beneficiaries (ages 65 and older) living in the community had not talked to their physician about osteoporosis in 2000. About one-third had received a bone density test for osteoporosis, but one-quarter had never heard of the test (Adler and Shatto 2002).

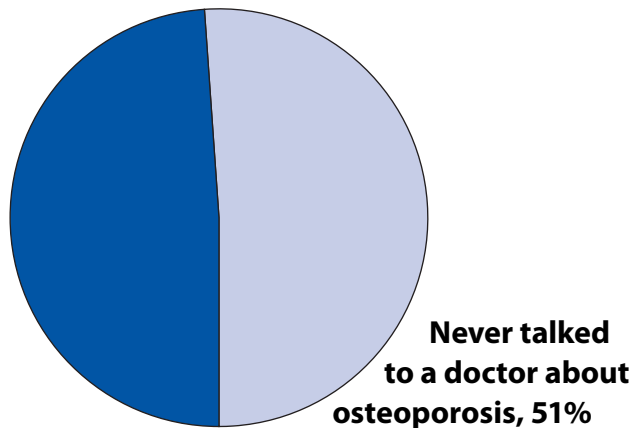
Implications: Because osteoporosis was an emerging issue at the time of this survey, these results should be considered a baseline for future improvement. Several studies have found that older men and women often are not screened or treated for osteoporosis after suffering a fracture, which represents a missed opportunity to prevent future fractures among those likely to be at high risk for osteoporosis (Kamel et al. 2000; Andrade et al. 2003; Solomon et al. 2003). One community increased rates of bone density testing and osteoporosis treatment by educating patients about osteoporosis when they visited hospital emergency departments (EDs) for wrist fractures and by having the EDs fax a guideline-based reminder to the patients’ primary care physicians to encourage follow-up care (Majumdar et al. 2004).

Osteoporosis Counseling and Screening

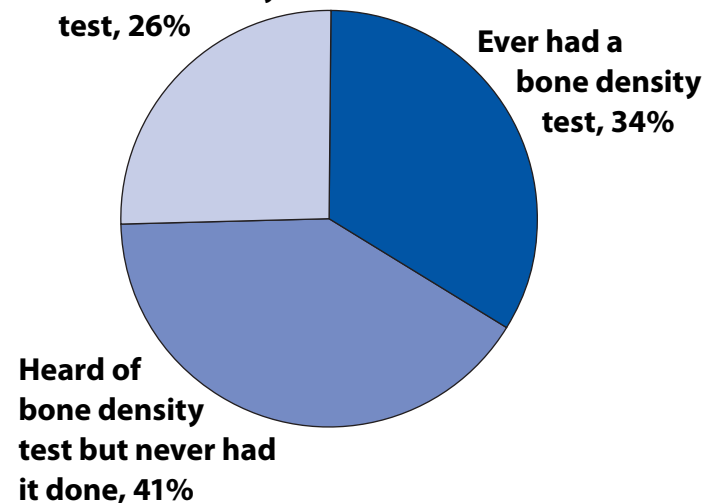
Osteoporosis screening became a Medicare-covered benefit in 1998, when the National Osteoporosis Foundation first recommended it for elderly women. In 2000, one-half of elderly female Medicare beneficiaries (ages 65 and older) said that they had ever talked to their doctor about osteoporosis, and one-third had ever had a bone density test to check for osteoporosis.

Percentage of community-dwelling, elderly female Medicare beneficiaries ages 65+ interviewed in 2000 who had:

Talked to a doctor
about osteoporosis, 49%



Never heard
of bone density
test, 26%



Source: 2000 Medicare Current Beneficiary Survey (Adler and Shatto 2002).



EFFECTIVENESS • STAYING HEALTHY • CHART 1:5

Falls and Instability: Screening and Management

Why is this important? Older adults are more prone to falls and mobility disorders than younger adults due to muscle weakness, gait and balance problems, visual and/or cognitive impairment, and medication side effects (Rubenstein et al. 2004). About one-third of community-dwelling elderly fall at least once per year. Fall-related fractures and injuries among the elderly are the cause of 1.6 million visits to hospital emergency departments and 388,000 hospital admissions each year (NCIPC 2005). Falls often result in functional decline, disability, and fear of falling, leading to loss of independence and many nursing home admissions (Tinetti and Williams 1997, 1998; Bezon et al. 1999).

Several intervention strategies are effective for reducing falls and instability including risk factor assessment and targeted exercise programs (Chang et al. 2004). Evidence-based guidelines for the prevention and management of falls state that clinicians should regularly ask patients about falls and instability and use diagnostic tests to identify causes and contributing factors, many of which will respond to intervention (AGS/BGS/AAOS Panel on Falls Prevention 2001).

Findings: Among at-risk* patients ages 75 and older treated in two medical groups participating in the Assessing Care of Vulnerable Elders (ACOVE-2) study during 2000–2001, only 40 percent were asked at least annually about the occurrence of recent falls. Among

those who had fallen, just more than half were asked about their fall history and less than a quarter had a basic fall examination. Although exercise programs were offered to 69 percent of those identified as having mobility problems, only 13 percent of patients with decreased balance were offered both an appropriate exercise program and an evaluation for an assistive device (Wenger et al. 2005).

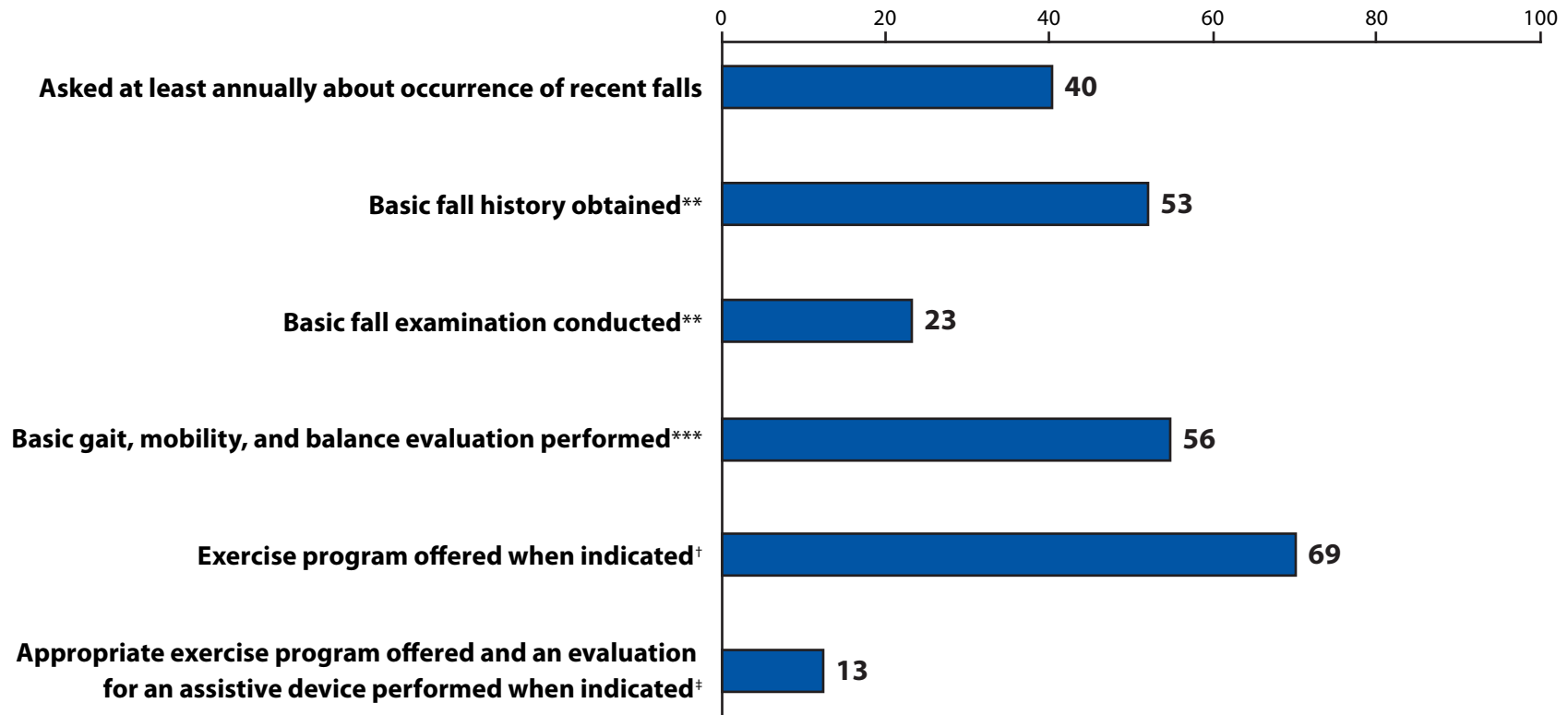
Implications: Although this study was limited to a small population, it suggests that many falls and mobility disorders likely go undetected in the elderly and that many opportunities for prevention are not being realized. The cost of fall-related injuries is substantial (Englander et al. 1996); Medicare spent \$5.5 billion for treatment of fractures among the elderly in 1999 (Bishop et al. 2002). There is some evidence that interventions to prevent falls can be cost-saving (Rizzo et al. 1996), suggesting that Medicare reimbursement for fall prevention programs might be cost-effective. Primary care physician education may be warranted to help elders avoid falls and resulting disability.

* At-risk patients included those who screened positive for falls or fear of falling, bothersome incontinence, or memory impairment.

Falls and Instability: Screening and Management

Falls and mobility disorders are common in the elderly and often lead to functional decline and loss of independence. A pilot study found that older patients at risk for these conditions often did not have an adequate examination or an evaluation that led to diagnostic and treatment recommendations. Therapy was not always offered even when problems were diagnosed.

Among at-risk patients* ages 75+ who were seen in two medical groups during 2000–2001, percentage whose care met expert standards



Source: Medical records from the Assessing Care of Vulnerable Elders (ACOVE-2) study (Wenger et al. 2005). *At-risk patients screened positive for falls or fear of falling, bothersome incontinence, or memory impairment (N=644). **Among those with two or more falls in the past year, or a single fall with injury requiring treatment. ***Within three months among those who report or are found to have new or worsening difficulty with ambulation, balance, and/or mobility. †Among those with gait, strength, or endurance problems. ‡Among those with decreased balance and/or proprioception or increased postural sway.

EFFECTIVENESS • GETTING BETTER • CHART 1:6

Inappropriate Use of Antibiotics for the Common Cold

Why is this important? Widespread over-prescribing of antibiotics contributes to the emergence of antibiotic-resistant strains of bacteria (Lewis 1995), which have been increasing in prevalence (Whitney et al. 2000). Antibiotic resistance threatens the effectiveness of the antibiotic arsenal for all patients. Moreover, antibiotic use puts an individual at risk for subsequent infection with antibiotic-resistant bacteria (Dowell and Schwartz 1997). Therefore, public health experts and medical societies recommend careful antibiotic use for patients who are most likely to benefit (Gonzales et al. 2001). The common cold is caused by a virus, against which antibiotics are not effective and never indicated.

Findings: The population-based rate of antibiotic prescribing at visits to physician offices and hospital outpatient clinics and emergency departments for patients diagnosed with the common cold decreased by 44 percent among the elderly and by 33 percent among middle-age adults from 1997–1998 to 2000–2001.* The elderly were 29 percent more likely than middle-age adults to receive antibiotics for the common cold in 2000–2001, as compared to 50 percent more likely in 1997–1998 (AHRQ 2005b).

Implications: The improvement in this population-based rate may reflect two factors: 1) patients may have less often visited physicians with the cold, and/or 2) physicians may have less often prescribed antibiotics when they did visit. This downward trend may reflect the effects of an intensive educational campaign undertaken by the Centers for Disease Control and Prevention in concert with state and local public health departments and medical societies (CDC 2005). Research in Finland suggests that reducing the use of antibiotics can lead to a decrease in the prevalence of antibiotic-resistant bacteria in the community (Seppala et al. 1997).

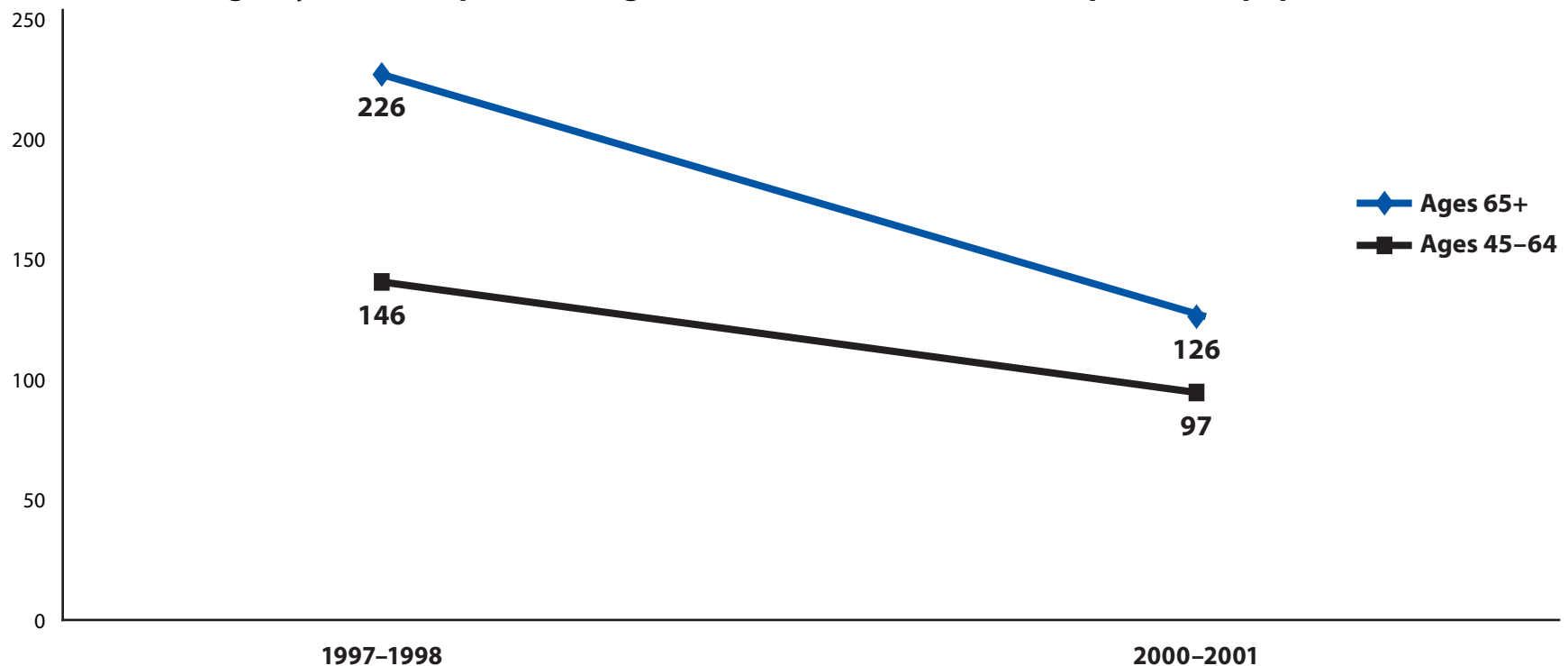
A multifaceted educational intervention for patients and physicians, combined with performance feedback for physicians, safely reduced inappropriate antibiotic prescribing among non-elderly adults in one health plan (Gonzales et al. 1999). Yet, no measurable effect was observed when the educational intervention was extended to include elderly patients. The authors of the study speculated that “factors other than patient expectations and demands may play a stronger role in antibiotic treatment decisions in elderly populations” (Gonzales et al. 2004).

* The numbers shown in the chart represent the rate of antibiotic prescribing within the entire civilian, noninstitutionalized population age-groups specified (e.g., 226 antibiotics prescribed per 10,000 community-dwelling elderly in 1997–1998 vs. 126 per 10,000 in 2000–2001).

Inappropriate Use of Antibiotics for the Common Cold

Antibiotics are never appropriate treatment for the common cold. Elderly patients are more likely than middle-age adults to receive antibiotics for a cold, whether because they more often visit physicians with a cold or because physicians are more likely to prescribe antibiotics when they do visit. The inappropriate use of antibiotics decreased among both age groups from 1997–1998 to 2000–2001, with a 44 percent decline among elderly patients.

Number of antibiotics prescribed at visits to physician offices, outpatient clinics, and emergency rooms for patients diagnosed with a common cold (rate per 10,000 population)*



Source: National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey (AHRQ 2005b).

*These data represent the rate of antibiotic prescribing within the entire civilian, noninstitutionalized population age-groups shown.



EFFECTIVENESS AND TIMELINESS • GETTING BETTER • CHART 1:7

Hospital Treatment for Pneumonia

Why is this important? About 600,000 Medicare beneficiaries are hospitalized with pneumonia each year (CMS 2000b). Previous research found that giving antibiotics to pneumonia patients within eight hours of hospital arrival resulted in a lower death rate (Meehan et al. 1997). In 2000–2001, hospitals achieved this goal for 85 percent of Medicare fee-for-service beneficiaries with pneumonia. Newer research has shown that antibiotic administration within four hours of hospital arrival is associated with further reductions in death rates and hospital length of stay (Houck et al. 2004). This four-hour standard was adopted for the Medicare Quality Improvement Organization program starting in 2002.

The American Thoracic Society and the Infectious Disease Society of America recommend that a blood culture be drawn before antibiotics are administered so that treatment can be tailored to the specific form of infection (Bartlett et al. 2000; Niederman et al. 2001). Timely collection of blood cultures (within 24 hours of hospital arrival) and use of recommended antibiotic combinations is associated with lower death rates (Meehan et al. 1997; Gleason et al. 1999).

Findings: During 2002, 81 percent of Medicare fee-for-service beneficiaries hospitalized with pneumonia had a blood culture collected before an antibiotic was administered (among those for whom cultures were collected at all), 63 percent had an antibiotic

administered within four hours of hospital arrival, and 68 percent were given an initial antibiotic consistent with current guideline recommendations. Only 30 percent of these patients received care consistent with all three standards. Among the states, rates of timely antibiotic administration varied by 31 percentage points from a low of 46 percent in Delaware to a high of 77 percent in South Dakota (AHRQ 2005b).

Implications: Evolving standards present a challenge for hospitals to continually improve quality of care. The rate of appropriate antibiotic selection decreased in 2002 from 84 percent in 2000–2001, probably because of a “lag time” for physicians to become aware of updated scientific guidelines for preferred antibiotic treatment (personal communication with Edwin Huff 2005).

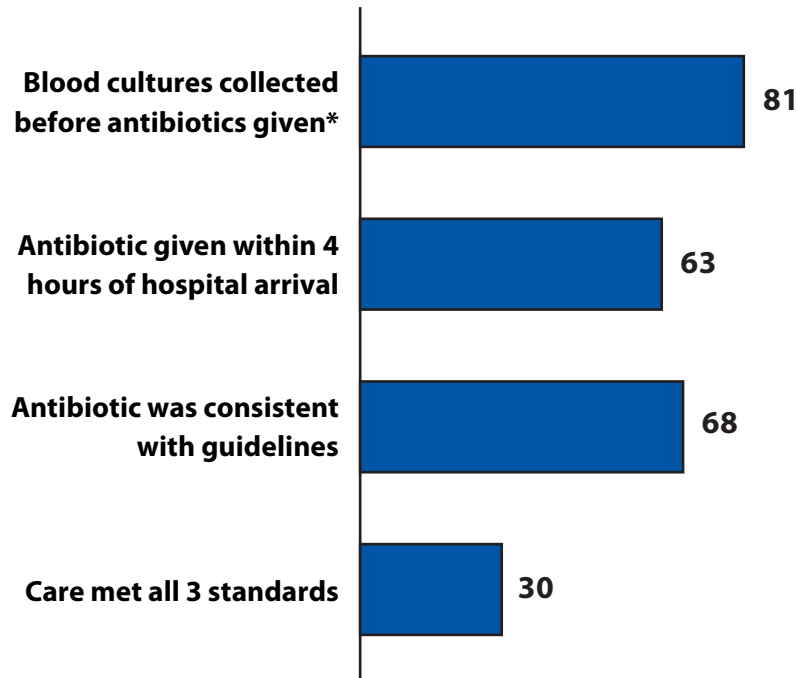
Hospitals in one state were more likely to improve evidence-based pneumonia treatment if they used a combination of quality improvement strategies including clinical pathways, standing orders, physician champions, multidisciplinary teams, and case managers (Tu et al. 2004). Many hospitalizations for pneumonia might be prevented altogether if more older adults were immunized as recommended and treated appropriately when they seek care in the outpatient setting (see Charts 1:1 and 1:11).

Hospital Treatment for Pneumonia

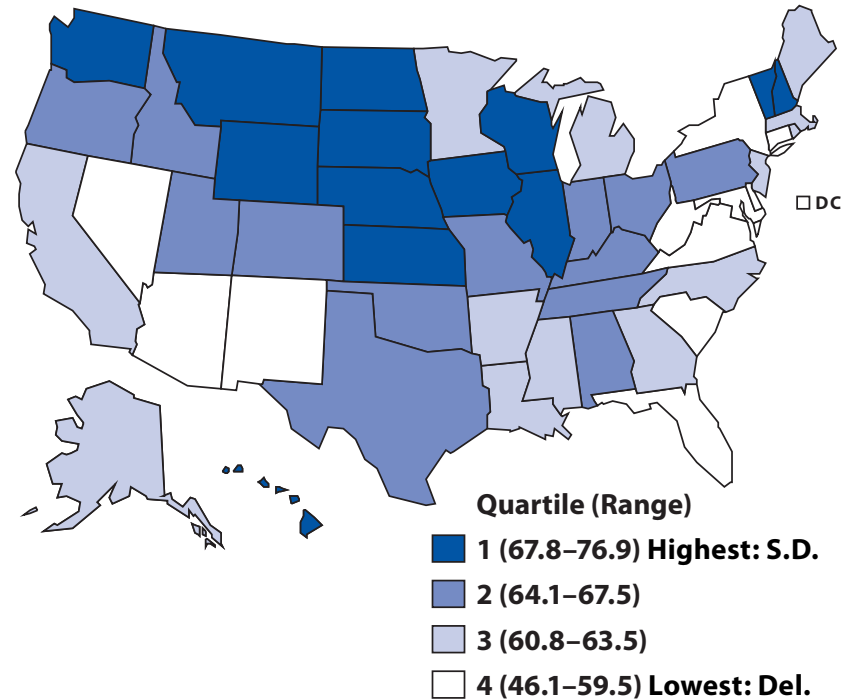
Evidence-based treatment of pneumonia is associated with reduced risk of death. Hospital treatment of Medicare fee-for-service beneficiaries with pneumonia met three guideline standards less than one-third of the time in 2002. Among the states, rates of timely antibiotic administration varied by 31 percentage points from lowest to highest.

Among Medicare fee-for-service beneficiaries hospitalized for pneumonia in 2002:

National percentage who received recommended treatment in the hospital



State performance for percentage who received antibiotics within 4 hours of hospital arrival, by quartile rank



Source: Centers for Medicare and Medicaid Services, review of medical records (AHRQ 2005b).

*Among those for whom a blood culture was ordered.



EFFECTIVENESS • GETTING BETTER • CHART 1:8

Hospital Treatment for Heart Attack

Why is this important? Coronary heart disease among Medicare beneficiaries manifests in more than 400,000 heart attacks requiring hospitalization each year. Evidence-based treatment guidelines recommend that heart attack patients receive certain medications early during hospitalization and/or afterwards as long-term preventive therapy to reduce the risk of a recurrent heart attack and improve the likelihood of survival (CMS 2003; Antman et al. 2004).

- **Aspirin** helps prevent the blood from clotting. Early use of aspirin for heart attack victims reduces short-term mortality by 23 percent. Long-term aspirin use after a heart attack lowers mortality by 13 percent.
- **Beta-blockers** ease the heart's pumping and reduce its need for blood and oxygen. Early beta-blocker administration improves survival by 4 to 5 percent. Long-term use after a heart attack improves survival by 23 percent.
- **ACE (angiotensin-converting enzyme) inhibitors** increase the supply of blood and oxygen to the heart. Long-term use after a heart attack among patients with impaired left ventricle function reduces their mortality up to 27 percent.

Findings: From 63 percent to 91 percent of elderly Medicare fee-for-service beneficiaries hospitalized for heart attack in 2002 received or were prescribed medications when indicated, depending on the drug and the patient's age (those with documented contraindications were excluded

from the analysis). Rates of treatment for those ages 85 and older were 4 to 10 percentage points lower than for those ages 65 to 74. Rates of beta-blocker prescribing increased from 2000-2001 to 2002 (see Appendix Table 1b), with the greatest increases occurring among those ages 85 and older (not shown) (AHRQ 2005b).

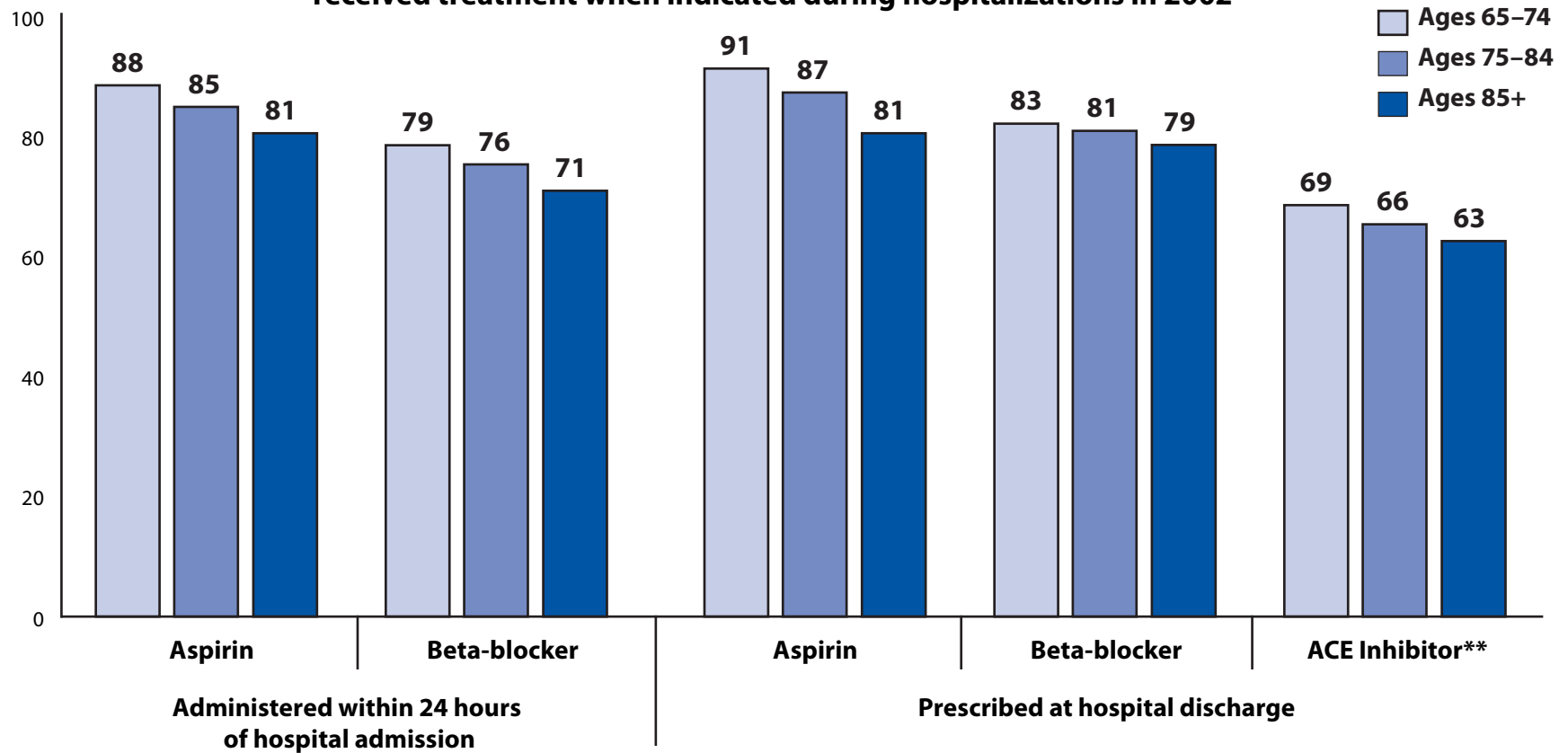
Implications: Performance on these measures has improved substantially from 1994-1995, when beta-blockers were given to only about half of Medicare fee-for-service beneficiaries hospitalized for heart attack and aspirin was given to about three-quarters (Burwen et al. 2003). Further improvement could save many more lives. The lower rate of treatment among the oldest elderly might reflect misconceptions about the benefits of treatment in the elderly; in some cases, however, treatment might not have been appropriate for very frail individuals. More data are needed to understand patterns of care and guide treatment for the oldest elderly. Chart 6:2 illustrates an intervention that improved heart attack treatment for Medicare patients, with the greatest improvements observed among the oldest elderly.

Note: Rates of ACE inhibitor prescription at hospital discharge do not account for the substitution of newer medications called angiotensin receptor blockers, which may add up to 10 percentage points to the rate and will be counted for compliance in future years (personal communication with Edwin Huff 2005).

Hospital Treatment for Heart Attack

In 2002, 63 percent to 91 percent of elderly Medicare patients hospitalized for heart attack received or were prescribed recommended medications to prevent a second heart attack, depending on the drug and the patient's age. Rates of treatment for those ages 85 and older were 4 to 10 percentage points lower than for those ages 65 to 74.

Percentage of Medicare fee-for-service heart attack patients who received treatment when indicated during hospitalizations in 2002*



Source: Centers for Medicare and Medicaid Services, review of medical records (AHRQ 2005b).

*Includes only patients with no documented contraindications to the medication.

**Among those with left ventricular systolic dysfunction.



EFFECTIVENESS AND TIMELINESS • GETTING BETTER • CHART 1:9

Time to Reperfusion for Heart Attack

Why is this important? Timely reperfusion improves survival among a subset of heart attack patients by increasing blood supply to the heart muscle.* Depending on the patient's risk factors and contraindications and the hospital's capabilities, reperfusion may be done with clot-dissolving drugs (thrombolysis) or a minimally invasive surgical procedure (percutaneous transluminal coronary angioplasty or PTCA). Timely PTCA can be more effective than thrombolysis when done in a capable facility, but many hospitals are not equipped for this procedure. Expert guidelines provide criteria for selecting the type of reperfusion and for transferring patients to capable facilities, but "appropriate and timely use of some reperfusion therapy is likely more important than the choice of therapy" (Antman et al. 2004).

The sooner reperfusion is started, the greater the benefit it confers (the benefits and risks may differ for patients over the age of 75). Current guidelines recommend that thrombolysis be started in eligible patients within 30 minutes of hospital arrival (door-to-needle time) and that PTCA should commence within 90 minutes (door-to-balloon time). However, the door-to-balloon time target was 120 minutes during the time period shown in the chart; the Medicare program uses this goal for quality evaluation purposes (personal communication with Edwin Huff 2005).

Findings: Among Medicare fee-for-service beneficiaries hospitalized for heart attack during 2000–2001 who were eligible for and received reperfusion, the median time to start reperfusion (measured from hospital arrival) varied widely across states.* The median time to initiate PTCA within a state ranged from 59 to 260 minutes and was 107 minutes in the median state. Two-thirds of the states met the door-to-balloon time goal of 120 minutes. The median time to initiate thrombolysis within a state ranged from 28 to 121 minutes and was 45 minutes in the median state. Only four states met the door-to-needle time goal of 30 minutes (AHRQ 2005b).

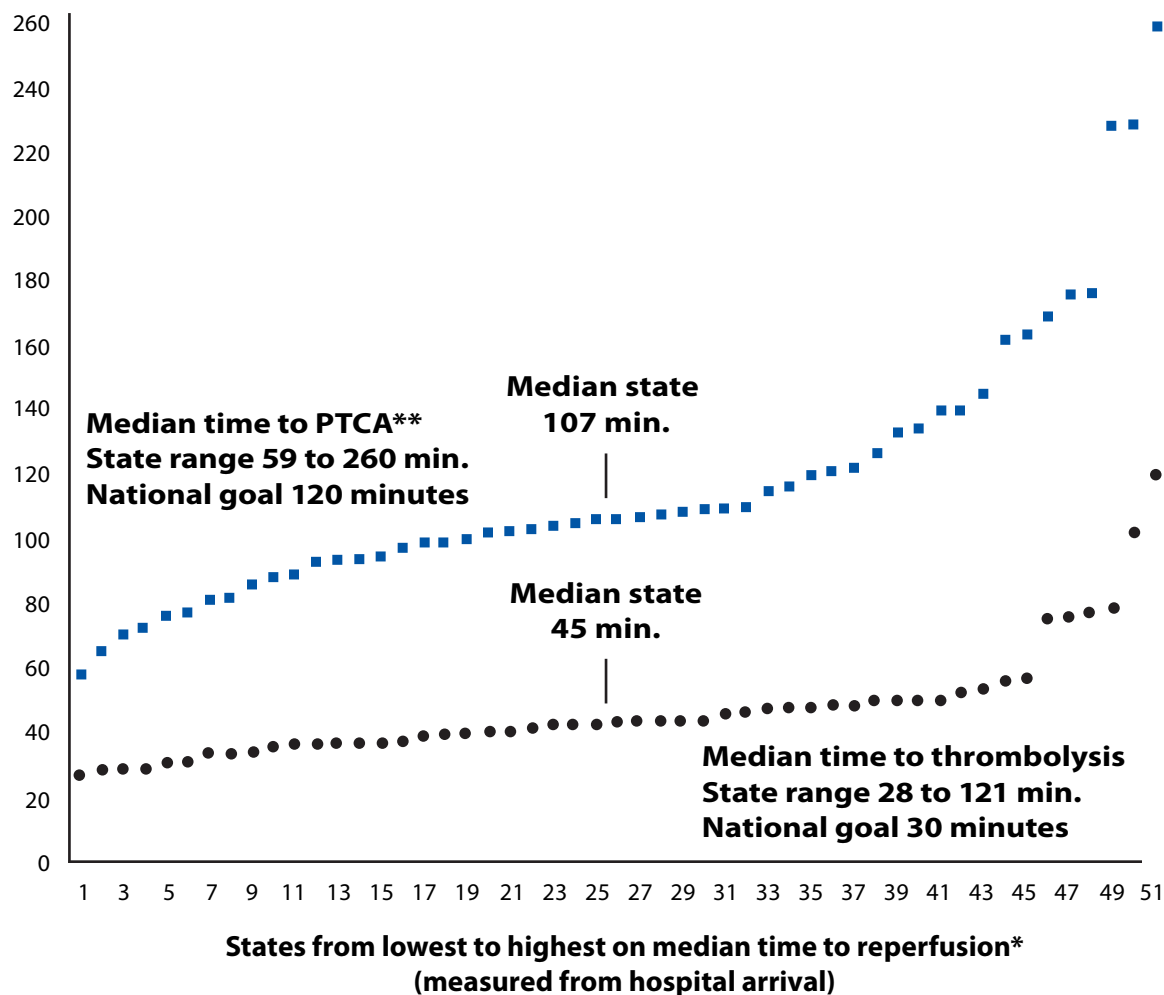
Implications: The guideline writers emphasize that timeliness goals "should not be perceived as an average performance standard but a goal of an early treatment system that every hospital should seek for every appropriate patient...Systems that are able to achieve even more rapid times for patients should be encouraged" (Antman et al. 2004). This implies an opportunity for improvement even in states where the median time met the target (since half of the patients had longer times). Data from the National Registry of Myocardial Infarction indicate that the elderly are more likely to experience delays in reperfusion compared to non-elderly heart attack victims (Angeja et al. 2002).

* Patients eligible for reperfusion include those with ST-elevation myocardial infarction or left bundle branch block.

Time to Reperfusion for Heart Attack

Median time to reperfusion for Medicare fee-for-service beneficiaries in 2000–2001, by state*

Reperfusion restores blood flow to the heart after a heart attack, either through a surgical procedure (angioplasty or PTCA) or clot-dissolving drugs (thrombolysis). The faster reperfusion is started, the greater the benefit. The median time from hospital arrival to start reperfusion varied widely across the states. The median time to initiate PTCA met the national goal of 120 minutes in two-thirds of the states. The median time to initiate thrombolysis met the national goal of 30 minutes in only four states.



Source: Centers for Medicare and Medicaid Services, review of medical records (Jencks et al. 2003). States include Puerto Rico and the District of Columbia (DC). Data were not available for thrombolysis in DC and for PTCA in Maine. *Includes only patients with ST-elevation myocardial infarction or left bundle branch block who received reperfusion. **PTCA = percutaneous transluminal coronary angioplasty.



EFFECTIVENESS • GETTING BETTER • CHART 1:10

Hospital Mortality

Why is this important? The Agency for Healthcare Research and Quality has identified several conditions and surgical procedures for which there is evidence that hospital mortality may be associated with the quality of care provided in the hospital (AHRQ 2002a). For example, timely and evidence-based hospital treatment of heart attack increases the likelihood of patient survival (see Charts 1:8 and 1:9). Considering mortality measured 30 days after hospitalization in conjunction with hospital mortality provides a more accurate picture of deaths that may be attributable to inpatient health care but that occur soon after discharge from the hospital (MedPAC 2004c).

Findings: Risk-adjusted* rates of in-hospital mortality steadily declined from 1995 to 2002 among Medicare fee-for-service beneficiaries hospitalized for eight conditions or procedures studied during this seven-year period. The largest absolute reduction in mortality occurred for those being treated for a heart attack (361 deaths per 10,000 discharges). The rates of death 30 days after hospital admission also decreased for these eight conditions or procedures from 1995 to 2000, with heart attack again showing the largest absolute reduction (272 deaths per 10,000 discharges) during this five-year period. However, 30-day mortality rates increased from 2000 to 2002 for six of the eight conditions or procedures, with mortality for stroke and pneumonia exhibiting the greatest absolute increases during this two-year period (187 and 180 deaths per 10,000 discharges) (MedPAC 2004c).

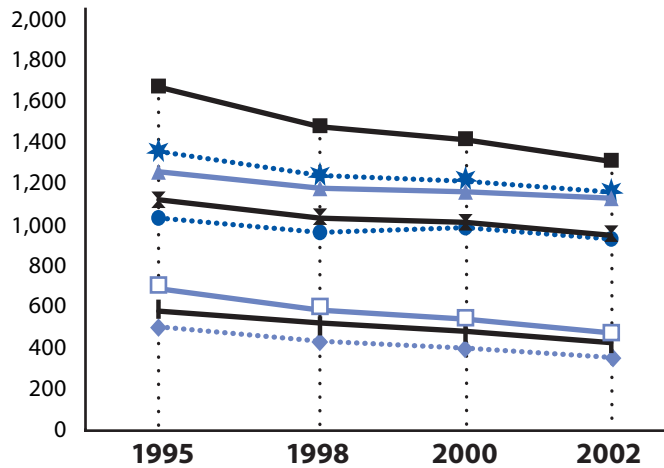
Implications: The improvement in hospital death rates for these conditions and procedures is encouraging and suggests that patients are receiving higher quality treatment in a timely manner while in the hospital, although improvements in diagnostic and treatment modalities also may play a role. The recent increase in 30-day mortality rates, however, provides reason for concern. This trend might indicate a variety of problems, such as inadequate quality in skilled nursing facilities or rehabilitation facilities to which hospital patients are discharged, or that hospitals are discharging patients without adequately educating patients and their caretakers on appropriate self-care, or that patients have inadequate follow-up care and support once they leave the hospital. Monitoring this trend and identifying its underlying causes will be critical for assuring effective patient care.

* Mortality rates were risk-adjusted to account for differences in patients' age, sex, and severity of illness over time; however, some clinical risk factors may not be fully accounted for using these methods and administrative data.

Hospital Mortality

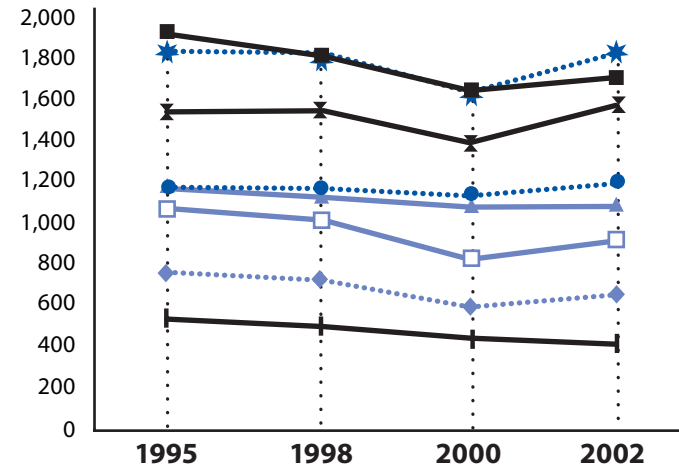
In-hospital death rates decreased between 1995 and 2002 among fee-for-service Medicare beneficiaries treated for eight conditions for which outcomes are related to the quality of hospital care. Rates of death within 30 days of hospital admission for these conditions decreased from 1995 to 2000 but increased for six of the conditions between 2000 and 2002.

Risk-adjusted in-hospital mortality rate per 10,000 Medicare fee-for-service beneficiaries discharged



	1995	1998	2000	2002
■ Heart attack	1,670	1,477	1,414	1,309
★ Stroke	1,357	1,240	1,212	1,159
▲ AAA repair	1,258	1,178	1,161	1,130
✕ Pneumonia	1,122	1,032	1,012	949
● Craniotomy	1,033	963	986	931
□ Heart failure	689	585	541	474
⊕ CABG	580	522	482	427
◆ GI hemorrhage	504	434	400	355

Risk-adjusted 30-day mortality rate per 10,000 Medicare fee-for-service beneficiaries discharged



	1995	1998	2000	2002
■ Heart attack	1,899	1,792	1,627	1,690
★ Stroke	1,816	1,808	1,620	1,807
✕ Pneumonia	1,525	1,531	1,377	1,557
● Craniotomy	1,164	1,158	1,123	1,182
▲ AAA repair	1,158	1,116	1,069	1,072
□ Heart failure	1,063	1,006	818	907
◆ GI hemorrhage	757	718	590	649
⊕ CABG	532	496	441	412

Source: Medicare Payment Advisory Commission (2004c) analysis of Medicare administrative data using AHRQ Inpatient Quality Indicators, risk-adjusted for age, sex, and severity of illness. AAA=abdominal aortic aneurysm; CABG=coronary artery bypass graft surgery; GI=gastrointestinal.



EFFECTIVENESS AND TIMELINESS • GETTING BETTER/LIVING WITH ILLNESS • CHART 1:11

Hospitalizations for Ambulatory Care Sensitive Conditions

Why is this important? Elderly Americans are more likely than any other age group to be hospitalized for conditions for which good ambulatory care is important, including congestive heart failure, chronic obstructive pulmonary disease, and diabetes complications (Kruzikas et al. 2004). Effective diagnosis, treatment, and patient education can help control the exacerbation of an illness and prevent or delay complications of chronic illness, thus reducing hospitalizations (Niefeld et al. 2003). Although hospitalization rates are influenced by socioeconomic factors and patient behaviors, high rates of potentially preventable hospitalizations might indicate suboptimal prevention, inadequate primary care, or barriers to obtaining timely and effective ambulatory care (Bindman et al. 1995; AHRQ 2002b).

Findings: Among Medicare fee-for-service beneficiaries, rates of hospital admissions (age- and sex-adjusted) increased from 1995 to 2002 for seven of 12 ambulatory care sensitive conditions studied (only the top 10 are shown on the chart). The rate of hospitalization due to bacterial pneumonia exhibited the largest absolute increase (38 per 10,000), while the rate for angina (chest pain) without the performance of a cardiac procedure decreased by a similar amount (36 per 10,000).^{*} In a similar example, the hospitalization rate for uncontrolled diabetes decreased by 4 per 10,000, while the rate for long-term complications of diabetes increased by 6 per 10,000 (MedPAC 2004c).

Implications: Reducing preventable hospitalizations could help to preserve Medicare funds for needed services while concurrently improving patient health. Assuming that an average hospital stay costs \$5,300 per admission, a 5 percent decrease in the 2,388,000 Medicare admissions for these 12 conditions in 2000 would translate to \$633 million in cost savings (see Technical Appendix). Two examples of possible strategies for doing so include: 1) promoting increased immunization among seniors to reduce admissions for pneumonia (see Chart 6:1), and 2) increasing the use of care coordination to reduce rehospitalizations among patients with congestive heart failure (see Chart 6:3).

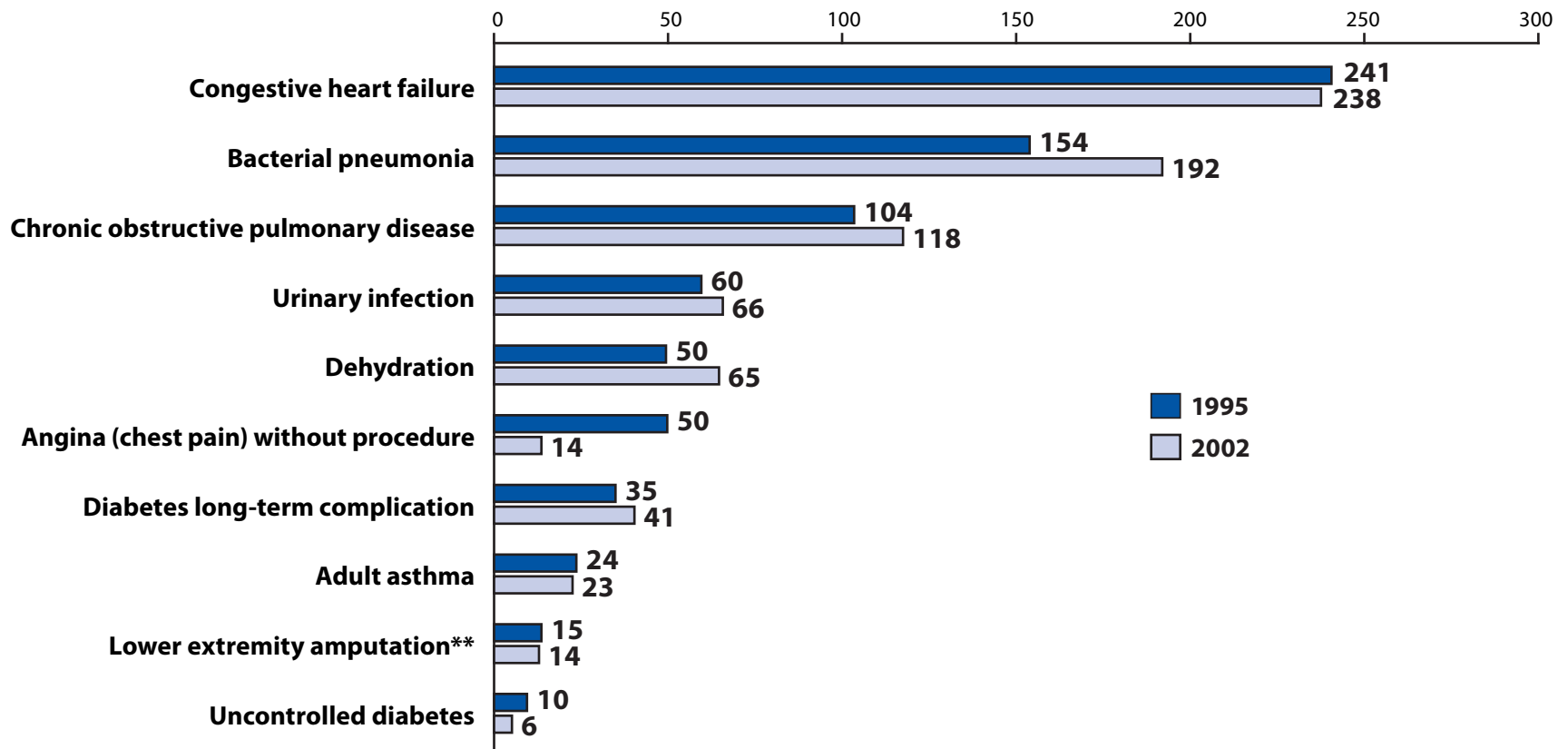
Focusing attention on Medicare beneficiaries with multiple chronic conditions might yield the greatest benefits since the likelihood of being hospitalized for an ambulatory care sensitive condition increases in proportion with the number of chronic conditions that an individual suffers (Wolff et al. 2002). Facilitating access to primary care in underserved geographic areas might reduce the higher rates of preventable hospitalizations among vulnerable Medicare beneficiaries in those areas (Parchman and Culler 1999; Epstein 2001).

^{*} The decrease in the rate of admissions for angina without procedure would not indicate an improvement in ambulatory quality of care to the degree that it was offset by any increase in admissions for angina with procedure.

Hospitalizations for Ambulatory Care Sensitive Conditions

Some hospitalizations might be preventable when patients receive timely and appropriate ambulatory care (for an example, see Chart 6:3). Rates of hospitalization increased from 1995 to 2002 for five of the 10 conditions shown.

Adjusted rate of potentially preventable hospitalizations (per 10,000 Medicare fee-for-service beneficiaries)*



Source: Medicare Payment Advisory Commission (2004c) analysis of Medicare administrative data using AHRQ Prevention Quality Indicators (only 10 highest rates shown). *Rates are age- and sex-adjusted. **Among those with diabetes.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:12

High Blood Pressure Awareness and Control

Why is this important? Hypertension, or high blood pressure, is a major risk factor for heart disease and stroke in the elderly and also can lead to kidney disease and vision problems when left untreated (Kilker et al. 2000). The prevalence of this chronic condition increases with age. Roughly half of all elderly Medicare beneficiaries, and two-thirds of elderly black adults, have high blood pressure (FIFARS 2004). Those with hypertension are generally less healthy and use more health care services than those without this chronic condition.

High blood pressure can be controlled with lifestyle modifications and/or medication. Many elderly have systolic hypertension, in which systolic pressure (the first number) is high but diastolic pressure (the second number) is low. In the past, this condition was considered a normal part of aging (AMA 2003), but research has shown that treatment reduces the incidence of stroke and cardiovascular disease in the elderly (Chaudhry et al. 2004). Because evidence for treatment is less strong for the oldest patients, expert guidelines emphasize the need to assess the potential benefits and risks of treatment for elderly patients on an individualized basis (Chobanian et al. 2003).

Findings: In a national survey conducted in 1998, most elderly and middle-age adults—92 percent—reported that their blood pressure had been measured within the past two years and could state whether their blood pressure

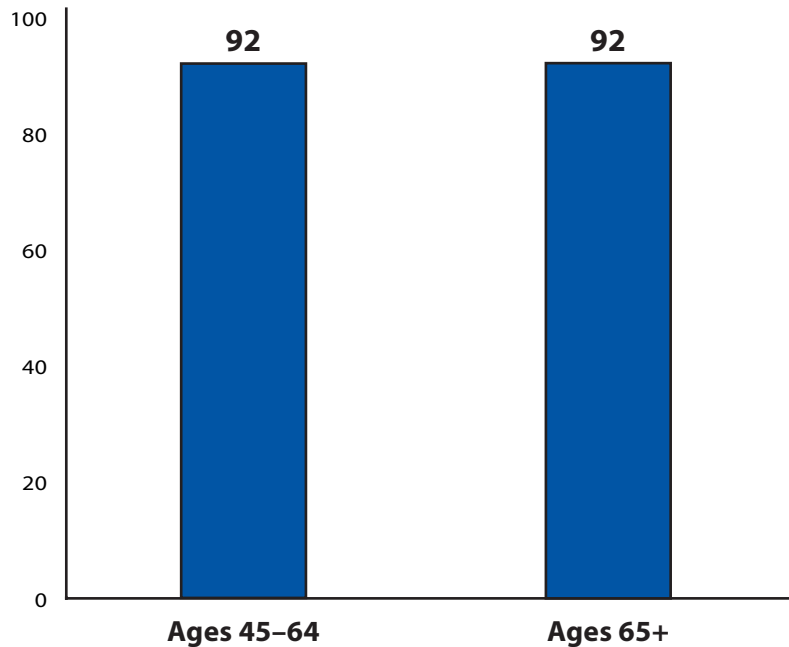
was normal or high. Despite this high level of awareness, another national study found that many of those whom researchers determined had high blood pressure (based on objective measurement) did not have their condition under control. Specifically, control of high blood pressure improved from 33 percent to 40 percent of middle-age adults (ages 45 to 64) during the 1990s, but remained unchanged at 24 percent of elderly adults (ages 65 and older) (AHRQ 2005b).

Implications: The elderly population is lagging far behind the national Healthy People 2010 goal that high blood pressure will be controlled for at least half of Americans with the condition (DHHS 2002a). Another analysis of the same survey shown in the chart found that middle-age and older adults with high blood pressure were equally likely to receive treatment during 1999–2000 (63 percent of each age group), but that older adults were less likely to achieve blood pressure control when treated (44 percent of those ages 60 and older vs. 66 percent of those ages 40–59) (Hajjar and Kotchen 2003). A review of quality-improvement studies found that many strategies were effective for improving hypertension care and outcomes (Walsh et al. 2005). Even small improvements in individual blood pressure control can have large health effects when considered on a population-wide basis.

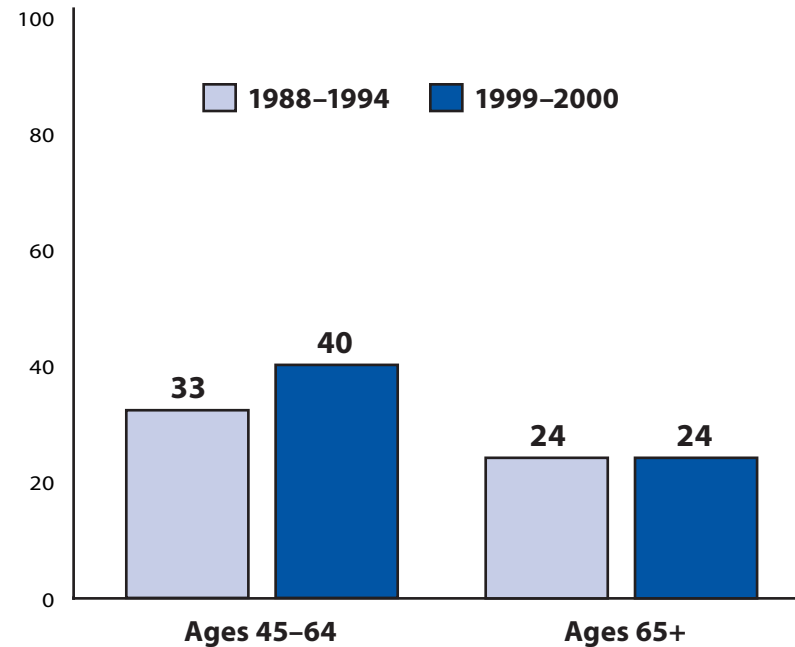
High Blood Pressure Awareness and Control

Most adults say they know whether they have high blood pressure. Only one-quarter of elderly adults with high blood pressure (as determined by researchers) had it controlled during 1999–2000, which was lower than the rate among middle-age adults. The improvement in blood pressure control among middle-age adults was not matched by any improvement among elderly adults during the 1990s.

Percentage of community-dwelling U.S. adults who reported that their blood pressure was measured in the past two years and can state whether it is normal or high, 1998



Percentage of community-dwelling U.S. adults with high blood pressure who had their blood pressure controlled (based on objective measurement)



Sources: National Health Interview Survey (AHRQ 2003) and National Health and Nutrition Examination Survey (AHRQ 2005b).
 Blood pressure control defined as 140/90 mmHg or lower.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:13

High Cholesterol Screening, Awareness, Treatment, and Control

Why is this important? Coronary heart disease (CHD), which is characterized by narrowing and blockage of arteries that supply blood to the heart, is the number one cause of death among elderly Americans (AHA 2005b). The incidence of CHD and its manifestations, such as heart attacks, increase with age. Prevention of disease “offers the greatest opportunity for reducing the burden of CHD in the United States” (Grundy et al. 2004). Two major modifiable risk factors for CHD are hypertension (see Chart 1:12) and high cholesterol.

National guidelines recommend that adults be screened for high cholesterol and supported in making lifestyle changes (e.g., diet, exercise, weight control) to reduce their risk for CHD, including high cholesterol (Pearson et al. 2002). For elderly adults at highest risk of CHD, or in whom lifestyle change is not successful, cholesterol-lowering therapy should be considered based on individualized assessment of efficacy, safety, tolerability, and patient preference. Although evidence is strongest for treating high cholesterol in the elderly with known heart disease, treatment is also likely to be effective in the elderly at risk for developing heart disease (NCEP 2001; Grundy et al. 2004). Current treatment strategies focus on reducing high levels of “bad” cholesterol (low-density lipoprotein or LDL).

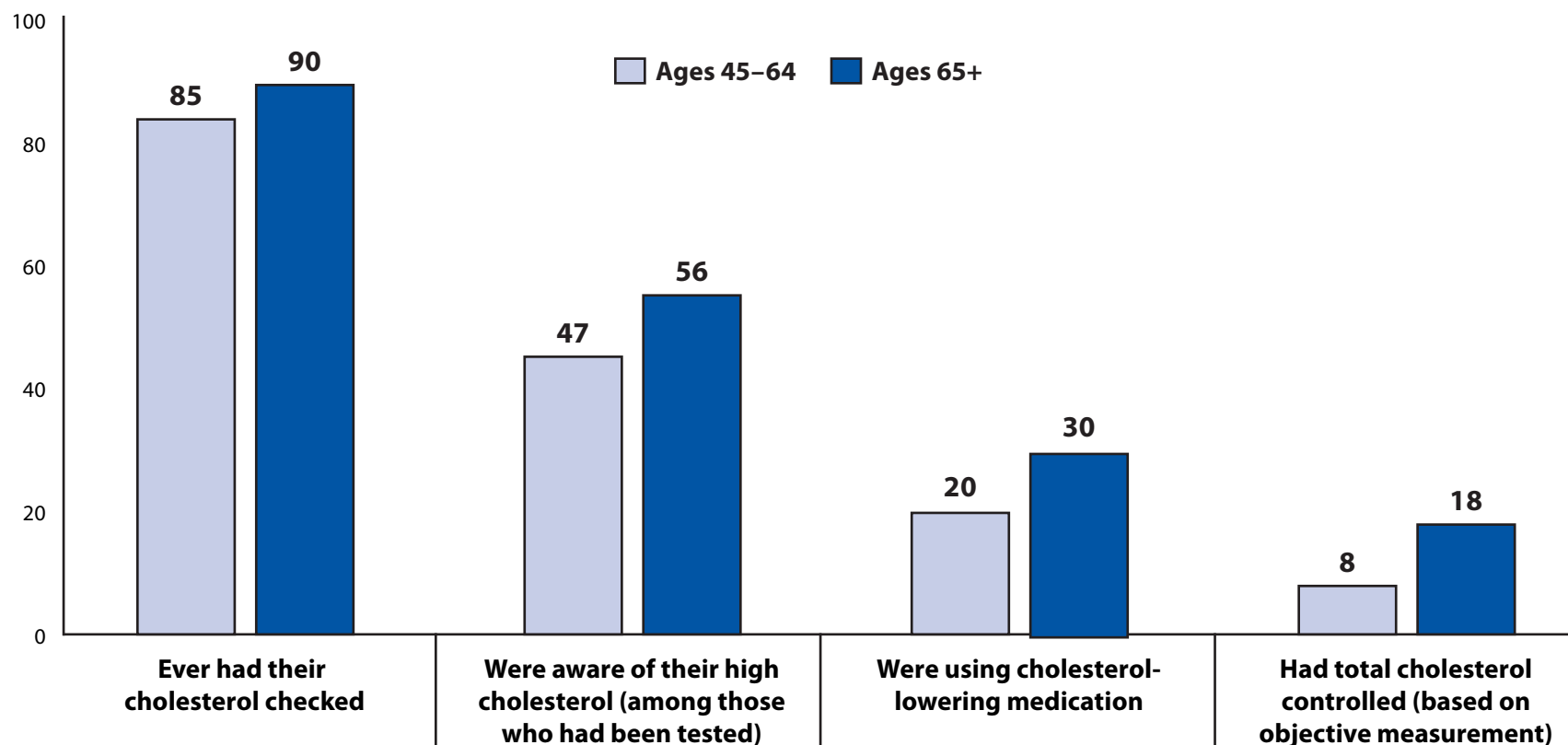
Findings: A nationally representative study conducted in 1999–2000 found that the majority of elderly U.S. adults (ages 65 and older) with high cholesterol (as determined by researchers) had their cholesterol checked in the past; however, barely more than one-half knew that it was high. Among all elderly with high cholesterol, 30 percent were taking cholesterol-lowering medication but only 18 percent had their high cholesterol controlled. The elderly were somewhat more likely than middle-age adults with high cholesterol to have been tested, exhibit awareness, take medications, and have their cholesterol controlled (Ford et al. 2003).

Implications: The higher rates of cholesterol testing, awareness, treatment, and control in elderly Americans is promising, but the control of high cholesterol in this population is still extremely low. The study did not report the proportion of elderly seeking to make lifestyle changes such as a healthy diet and regular exercise. The American Heart Association guideline authors note that a “physician-patient partnership must be forged, on the physician’s part by assessing and communicating risk and by co-developing with the patient a plan of preventive action” (Pearson et al. 2002).

High Cholesterol Screening, Awareness, Treatment, and Control

Most elderly adults whom researchers determined had high cholesterol reported that they had a cholesterol test in the past, but little more than half said they knew they had high cholesterol, less than one-third were using cholesterol-lowering medications, and few had achieved control over their high cholesterol. Rates were somewhat higher for elderly than middle-age adults.

Among a nationally representative sample of community-dwelling U.S. adults with high cholesterol (as determined by researchers) during 1999–2000, percentage who:



Source: National Health and Nutrition Examination Survey (Ford et al. 2003). Participants were classified as having high cholesterol if they reported using cholesterol-lowering medications or if a blood test showed total cholesterol of 200 mg/dL or higher. Cholesterol was classified as controlled if a blood test showed total cholesterol was under 200 mg/dL. All results are reported for the entire sample and are weighted to be nationally representative.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:14

Cardiovascular Care and Outcomes in Managed Care Plans

Why is this important? About 5 million Medicare beneficiaries are enrolled in managed care plans that contract with the Medicare program to provide Medicare-covered services to their members. Under the Balanced Budget Act of 1997, Congress required Medicare managed care plans to use an established process for improving quality of care delivered to Medicare enrollees (MedPAC 2002b). Medicare plans also must report on clinical quality using a set of standard indicators (called HEDIS) developed by the National Committee for Quality Assurance (NCQA). The NCQA uses similar indicators to measure quality of care delivered to privately insured individuals in employer-sponsored health plans. Aggregate results are published by the NCQA in an annual State of Health Care Quality report and Medicare plan-specific results are published on the Centers for Medicare and Medicaid Services Web site. HEDIS includes several measures of cardiovascular disease care (see Appendix Table 2 for other indicators).

Findings: Managed care plans and their participating providers improved cardiovascular care for adults in both Medicare and employer-sponsored plans from 2000 to 2003. Among Medicare beneficiaries who suffered a heart attack, the proportion who received beta-blocker medication increased by 4 percentage points, the proportion who had their cholesterol checked increased by 10 percentage points, and the proportion

with high cholesterol controlled (an intermediate outcome measure) increased by 14 percentage points. The proportion of those with diagnosed high blood pressure who had it controlled also increased by 14 percentage points. Medicare and employer plan members received comparable care and achieved comparable outcomes (NCQA 2004).

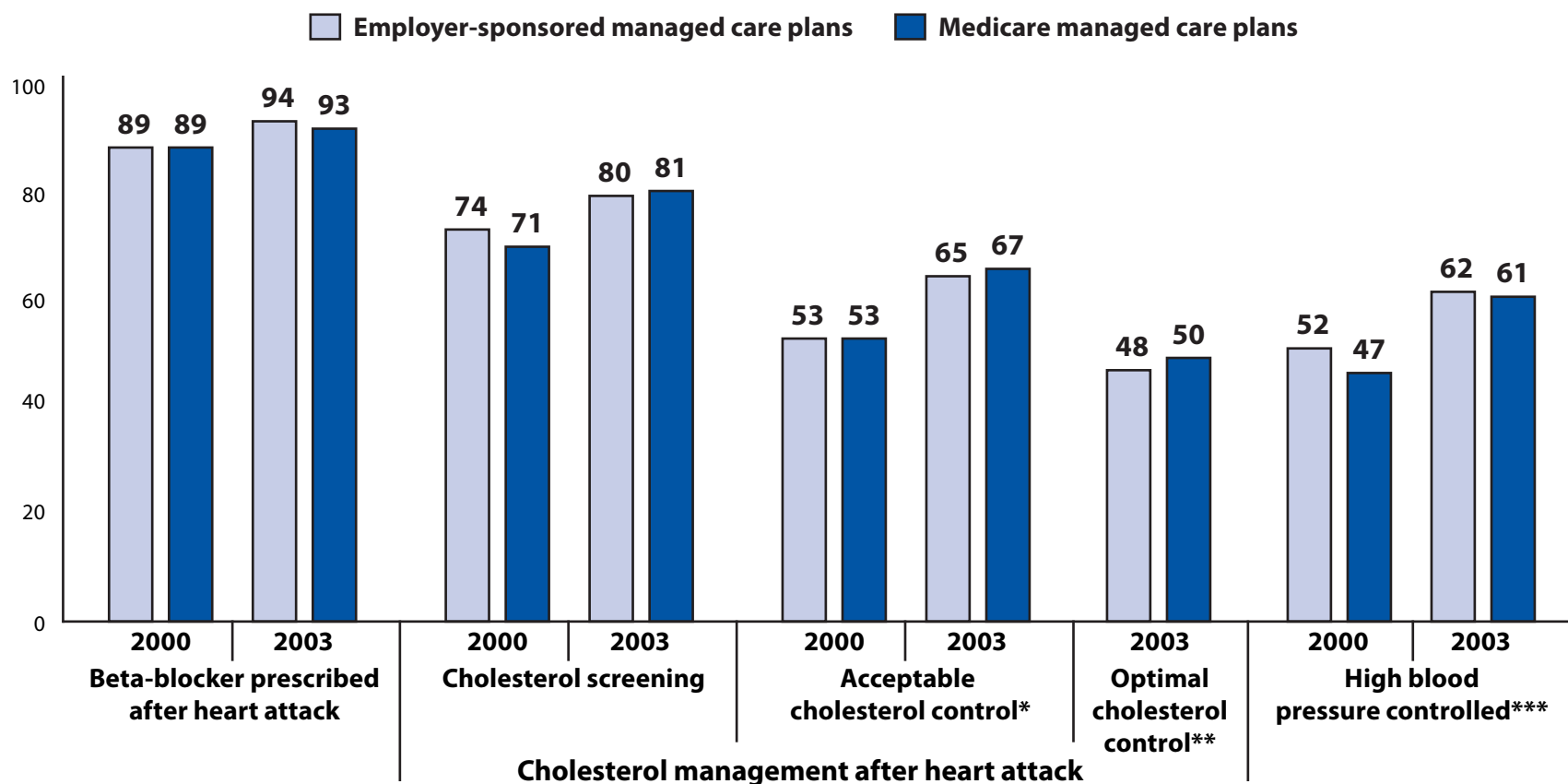
Implications: Despite promising gains in the cardiovascular care received by Medicare beneficiaries in managed care plans, adequate control of cardiovascular disease risk factors was not attained by roughly one-third. In 2003, the NCQA began reporting on the proportion of managed care plan members who attained optimal cholesterol control after a heart attack, and this was achieved by only one-half. If every Medicare beneficiary received quality of care equivalent to that provided through the best-performing health plans, thousands of heart attacks, strokes, and deaths could be prevented annually (NCQA 2004). Reporting publicly on performance may provide an important incentive for improvement.

Note: The results shown here are not measured in the same way as, and therefore are not directly comparable to, those reported on Charts 1:8, 1:12 and 1:13.

Cardiovascular Care and Outcomes in Managed Care Plans

Managed care plans and their affiliated providers achieved improvements in cardiovascular care and outcomes for adults in both Medicare and employer plans from 2000 to 2003. Medicare plan members were about equally as likely as employer plan members to receive recommended treatment and both groups achieved comparable outcomes in 2003.

Percentage of eligible adult health plan members who received recommended care or achieved good outcomes



Source: HEDIS (NCQA 2004). *LDL-C <130 mg/dl. **LDL-C <100 mg/dl. ***Blood pressure of 140/90 mmHg or less. These data are not directly comparable to data reported in Charts 1:8, 1:12, and 1:13 because of differences in measures and methods.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:15

Stroke Prevention for Outpatients with Atrial Fibrillation

Why is this important? Atrial fibrillation (AF), characterized by a rapid and irregular heart beat, affects up to 5 percent of the elderly ages 65 and older, and up to 10 percent of those ages 80 and older (Go et al. 2001; AHA 2005a). In a person with AF, the heart's upper chambers quiver and do not completely pump out blood. As a result, blood may pool and clot. These blood clots can dislodge and travel to the brain, causing a stroke. Fifteen percent of strokes occur in persons with AF, and about half of all AF-related strokes occur in persons older than age 75 (AHA 2005a).

The American Heart Association, American College of Cardiology, and the American College of Chest Physicians recommend that persons with AF who are at high risk for stroke should use an adjusted-dose oral anticoagulant (“blood thinner”) such as warfarin, which can reduce the risk of stroke by up to 60 percent in these individuals (Fuster et al. 2001; Singer et al. 2004). This medication requires frequent monitoring and careful dosing to minimize the risk of abnormal bleeding. Patients who are at low risk for stroke or who cannot safely take anticoagulants should take aspirin.

Findings: In a national sample of visits to physicians by patients with diagnosed AF and no documented contraindications, the prescription of anticoagulant medication increased from 1991 to 2000 by 10 percentage points among those ages 65 to 79 and by 34 percentage

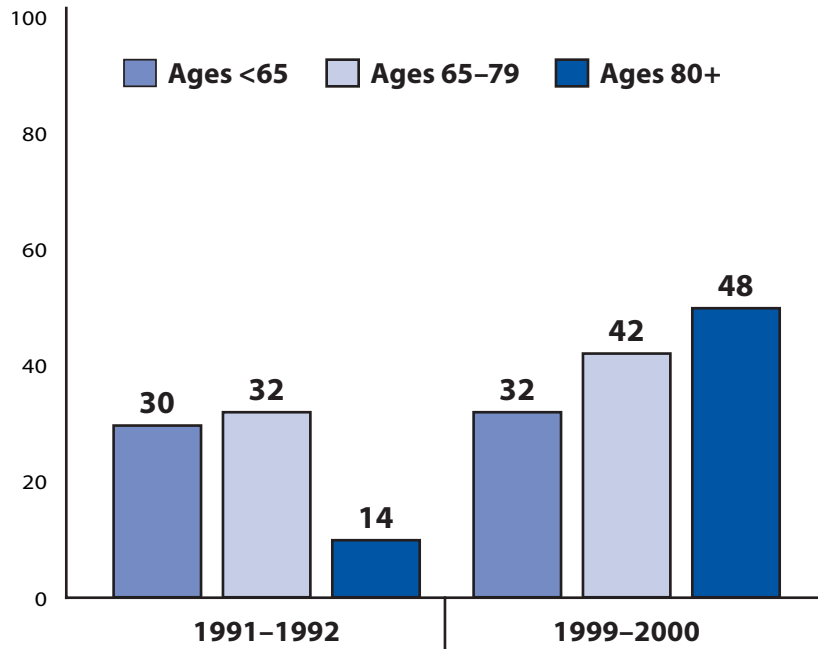
points among those ages 80 and older. In contrast, there was little change in the prescription of anticoagulants for nonelderly adults with AF. Among visits by patients at the highest risk for stroke, the proportion at which anticoagulants were prescribed increased by 22 percentage points from 1991 to 2000, whereas the prescription of aspirin remained relatively constant (Fang et al. 2004).

Implications: Increased anticoagulation for AF during the 1990s probably reflects the influence of evidence-based treatment recommendations. Anticoagulation is not always optimally managed among patients who do receive it (Samsa et al. 2000). Some studies report improved medication management and fewer adverse events when patients are assigned to an anticoagulation clinic or service in which a pharmacist helps manage warfarin therapy (Wilt et al. 1995; Chiquette et al. 1998; Wilson et al. 2003). Patient self-management education and home self-monitoring has been shown to improve anticoagulation control and safety (Siebenhofer et al. 2004; Menendez-Jandula et al. 2005), but lack of insurance coverage is perceived as a barrier to wider adoption in the United States (Wittkowsky et al. 2005).

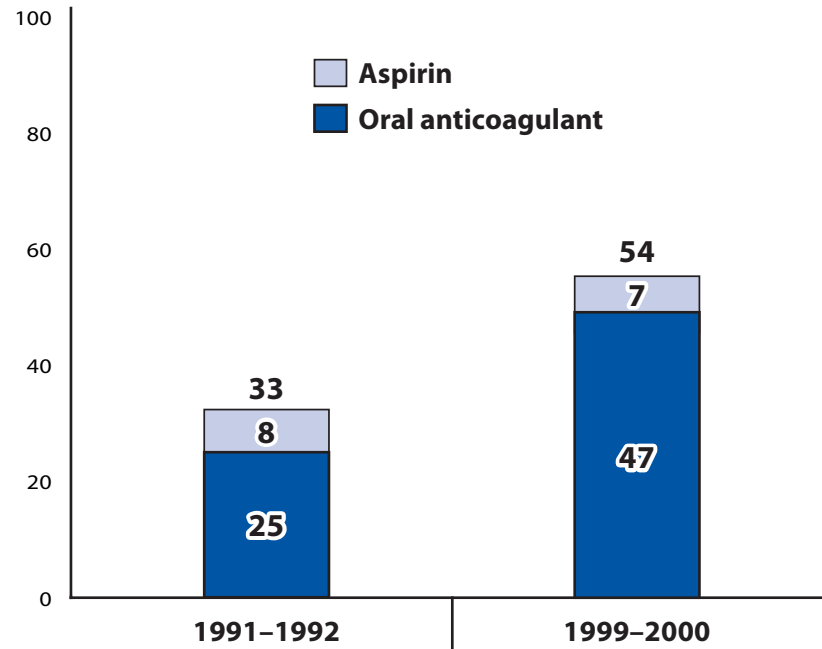
Stroke Prevention for Outpatients with Atrial Fibrillation

More elderly patients with a rapid and irregular heart beat are being prescribed recommended blood thinning drugs to reduce their risk of stroke, especially the oldest who are at higher risk for stroke, but many more patients could probably benefit.

Percentage of physician visits by patients with atrial fibrillation at which an oral anticoagulant medication was prescribed or continued*



Percentage of physician visits by patients at the highest risk for stroke at which an anticoagulant or aspirin was prescribed or continued**



Source: 1991-2000 National Ambulatory Medical Care Surveys (Fang et al. 2004). *Aspirin use is not shown but was fairly constant at 10 percent to 11 percent of visits from 1991-1992 to 1999-2000 for all patients with atrial fibrillation (AF). **Patients at highest risk for stroke are defined as those with AF who were older than age 75 or who had a prior diagnosis of transient ischemic attack or stroke (excluding intracranial hemorrhages), valvular heart disease, hypertension, or heart failure. These data represent civilian, noninstitutionalized individuals.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:16

Diabetes Management

Why is this important? Diabetes is associated with increased functional disability and premature death among the elderly and is a risk factor for heart disease. Diabetes prevalence increases with age. Fourteen percent of elderly white adults and almost one-quarter of elderly black and elderly Hispanic adults report that they have diabetes (FIFARS 2004).

Research in nonelderly populations has found that the development and progression of diabetes complications can be reduced through control of blood sugar, blood pressure, and blood lipids. Complications of diabetes include blindness, kidney failure, and cardiovascular disease resulting in heart attacks, strokes, and amputations. Intensive diabetes management requires a number of years to produce benefits and may reduce quality of life in the short term. Therefore, treatment for diabetes must be customized to the needs of the elderly individual considering life expectancy and disease comorbidities, with regular monitoring to adjust therapy and goals as appropriate (Brown et al. 2003).

Findings: Among community-dwelling elderly Americans (ages 65 and older) with diabetes in 2001, nine of 10 (89%) reported that they had received a glycosylated hemoglobin test in the past year, which provides a three-month average reading of blood sugar control so that the doctor can adjust medications and recommend diet and exercise changes. Likewise, most (95%) had their blood lipids checked to monitor control of abnormal

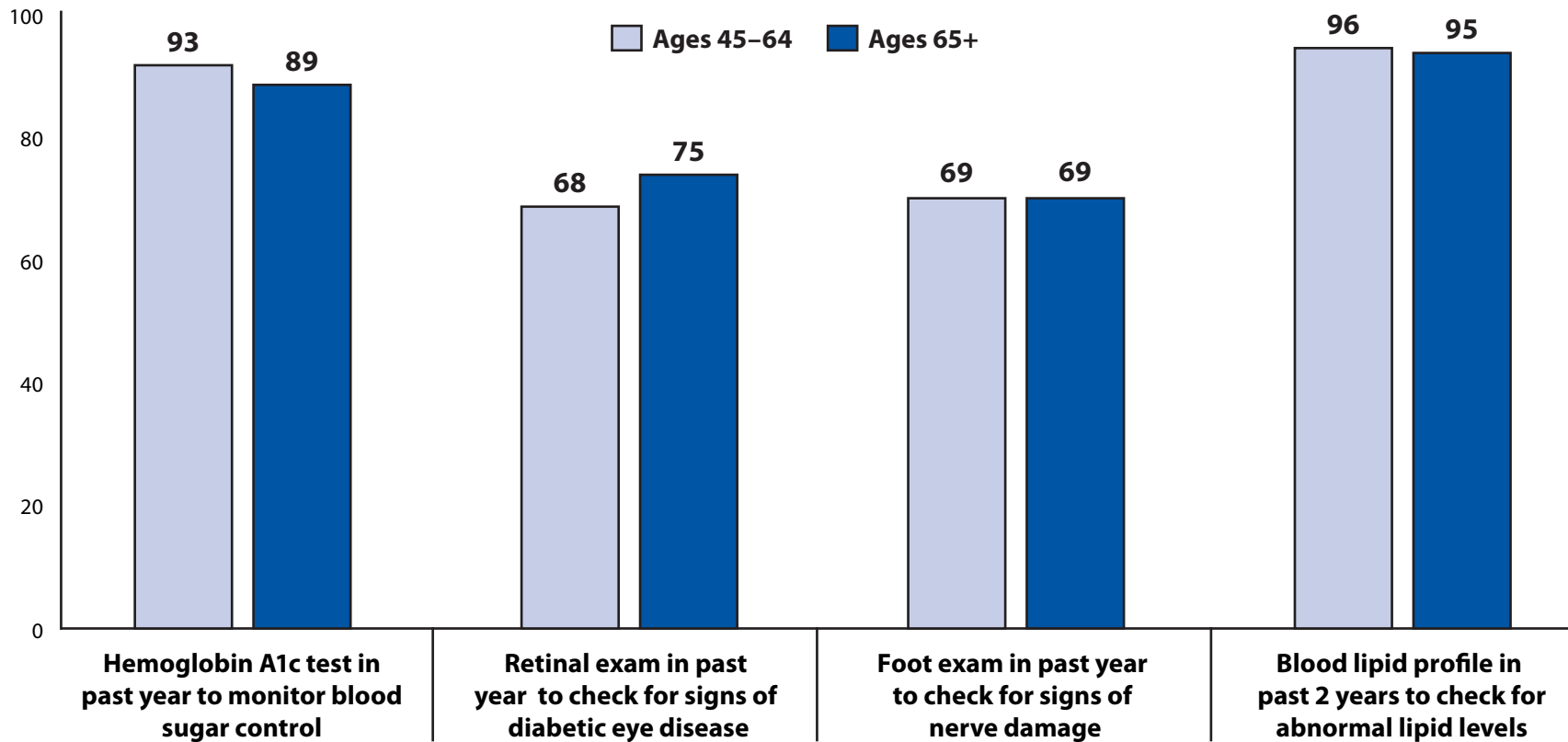
lipid levels, which can lead to complications of heart disease. However, one-quarter (25%) did not have the recommended annual dilated eye examination to check for signs of retinopathy, an eye disease that can lead to blindness, and three of 10 (31%) did not have their feet checked for signs of nerve damage. Compared to middle-age adults (ages 45–64), the elderly were somewhat less likely to receive a hemoglobin test but were more likely to receive an eye exam (AHRQ 2005b).

Implications: Diabetes management requires a collaboration between health care professionals and their patients, often involving the expertise of a multidisciplinary care team (Jack et al. 2004). In 1998, Medicare began covering the cost of a diabetes education program, blood glucose monitors, and testing strips, which can help patients manage and control their diabetes (ADA 2004). Longitudinal data from the Medicare Quality Improvement Organization program (Jencks et al. 2003), Medicare managed care plans (NCQA 2004), and state-level surveys (CDC 2002) indicate that diabetes care has been improving among all adults with diabetes, including the elderly. A review of quality improvement studies found that multifaceted approaches involving organizational change, patient education, and/or provider education can be effective in improving clinician compliance with guidelines and patient outcomes of care (Shojania et al. 2004).

Diabetes Management

Most elderly Americans with diabetes report that they are receiving recommended tests to monitor their blood sugar and lipids. One-quarter did not have an eye exam and three of 10 did not have their feet checked for signs of diabetes complications. Compared to middle-age adults, the elderly were somewhat less likely to receive a hemoglobin A1c test but were more likely to receive an eye exam.

Percentage of community-dwelling U.S. adults with diabetes who reported that they received recommended care in 2001



Source: Medical Expenditure Panel Survey (AHRQ 2005b).



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:17

Osteoarthritis: Evaluation and Treatment

Why is this important? Osteoarthritis, a degenerative condition in which the joints become stiff, swollen, and painful, is prevalent among the elderly, affecting more than 50 percent of individuals ages 65 years and older and more than 85 percent of those ages 75 and older. Although there is no cure for osteoarthritis, several forms of treatment can reduce pain, limit functional impairment, and maintain or improve joint mobility (AHRQ 2002d).

The American College of Rheumatology (ACR 2000), American Academy of Orthopaedic Surgeons (AAOS 2003), and American Geriatrics Society (AGS 1998, 2001) have published guidelines that emphasize the importance of pain assessment and patient education and self-management. The guidelines recommend a combination of nonpharmacologic therapy and drug therapy. Research shows that exercise can reduce or eliminate many of the major risk factors for osteoarthritis, including obesity, muscle weakness, inactivity, and poor joint biomechanics. A recent review of evidence supports recommendations that acetaminophen be considered as initial therapy for mild to moderate joint pain, because it causes fewer adverse reactions than nonsteroidal anti-inflammatory drugs (NSAIDs) (Wegman et al. 2004).

Findings: Among at-risk* patients ages 75 and older with osteoarthritis treated in two medical groups participating in the Assessing Care of Vulnerable Elders (ACOVE-2) study during 2002–2003, only three of five were evaluated

for pain at least annually. More than two-thirds were offered education regarding the treatment and self-management of their condition, but less than half of those eligible were prescribed a strengthening or exercise program. Acetaminophen was the first-line therapy among only three of five using drug therapy. Patients prescribed NSAIDs were often not warned of the risks associated with these drugs or offered prophylaxis for gastrointestinal bleeding when they were at potential risk for these side effects. Almost three-quarters of those eligible were offered a referral for surgical evaluation (Wenger et al. 2005).

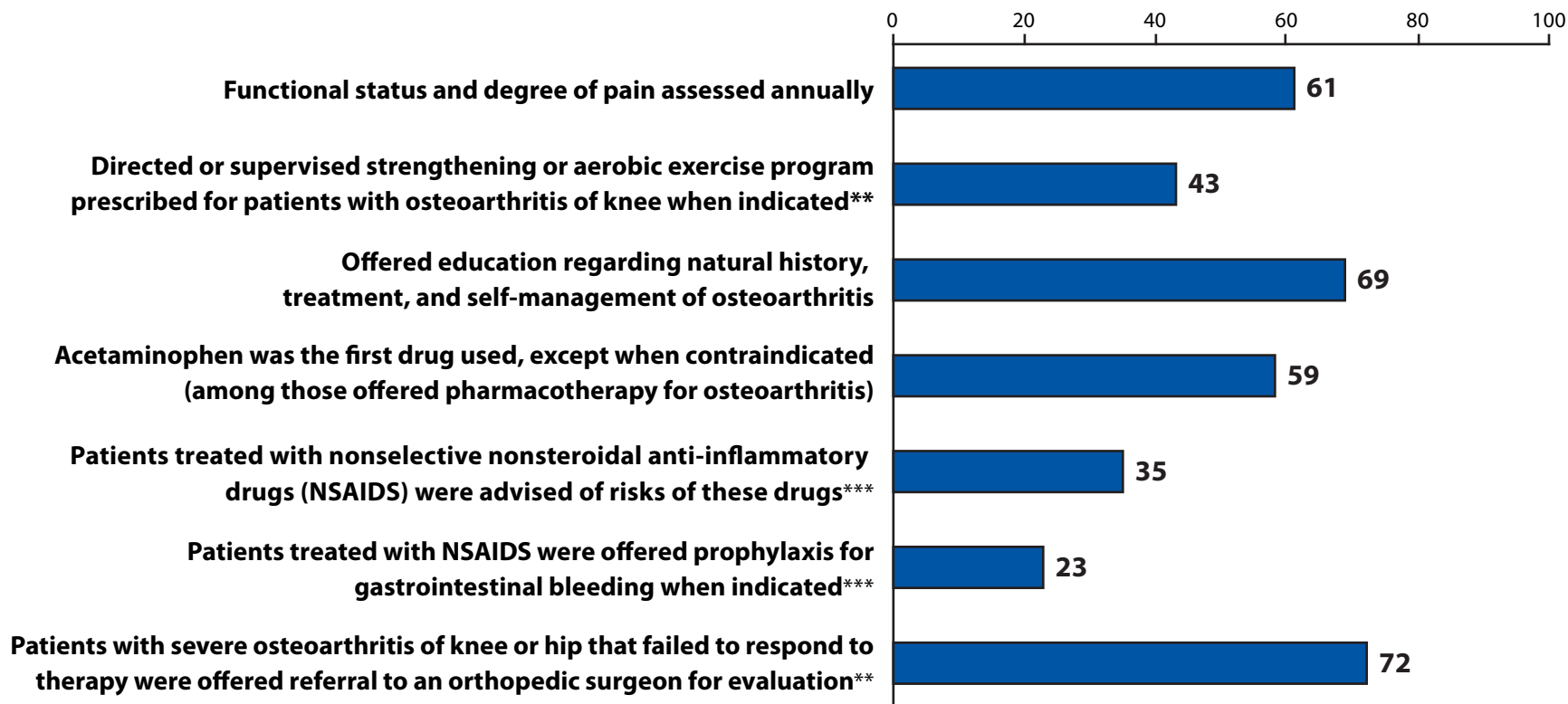
Implications: These exploratory findings, based on a limited population, suggest that treatment practices for osteoarthritis in older individuals may not be in accord with evidence-based expert recommendations. Wider use of standard quality measures for osteoarthritis would enable better understanding and improvement of osteoarthritis care practices. Recent media coverage surrounding the market withdrawal of a popular prescription painkiller might be prompting wider discussion of the risks posed by NSAIDs than was common at the time of this study.

* At-risk patients included those who screened positive for falls or fear of falling, bothersome incontinence, or memory impairment.

Osteoarthritis: Evaluation and Treatment

Osteoarthritis is the most prevalent chronic disease among older adults, causing up to half of all disability among seniors. A pilot study found that older patients with osteoarthritis were often not evaluated for pain, provided patient education, or prescribed recommended therapies. Almost three-quarters were referred for surgical evaluation when appropriate.

Among at-risk patients* ages 75+ with osteoarthritis who were seen in two medical groups during 2002–2003, percentage whose care met expert standards



Source: Medical records and patient interviews from the Assessing Care of Vulnerable Elders (ACOVE-2) study (Wenger et al. 2005). *At-risk patients screened positive for falls or fear of falling, bothersome incontinence, or memory impairment (N = 644). **Except when contraindicated. ***Among all ACOVE-2 patients treated with NSAIDs.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:18

Urinary Incontinence: Screening and Management

Why is this important? Urinary incontinence (UI) affects almost one-quarter (22%) of community-dwelling Medicare beneficiaries ages 65 and older and more than one-third (35%) of those ages 85 and older (NCHS 2005). This problem can reduce an individual's quality of life, leading to social isolation, loss of self-esteem, and depression. Dependence on caregivers increases as incontinence symptoms worsen. UI is one of the major causes of institutionalization of the elderly, prevalent in more than 50 percent of the individuals in nursing facilities (Gnanadesigan et al. 2004).

Treatment options for the management of UI in adults may include behavior therapy, medication, and surgery (AHRQ 1996). When offered a choice, most patients prefer behavioral therapy, which is effective in reducing UI for up to 80 percent of ambulatory and mentally competent adults (Diokno and Yuhico 1995; Burgio et al. 1998; Teunissen et al. 2004).

Findings: Among at-risk* patients ages 75 and older treated in two medical groups participating in the Assessing Care of Vulnerable Elders (ACOVE-2) study during 2000–2001, fewer than two of five were screened by their doctors to determine if they had UI. Physicians treating those with UI obtained a complete history or performed a physical exam for only about half of the patients, and recommended lab work was often not performed.

Although physicians discussed treatment options with most individuals with UI, behavioral treatment was offered to only 15 percent of patients who could potentially benefit (Wenger et al. 2005).

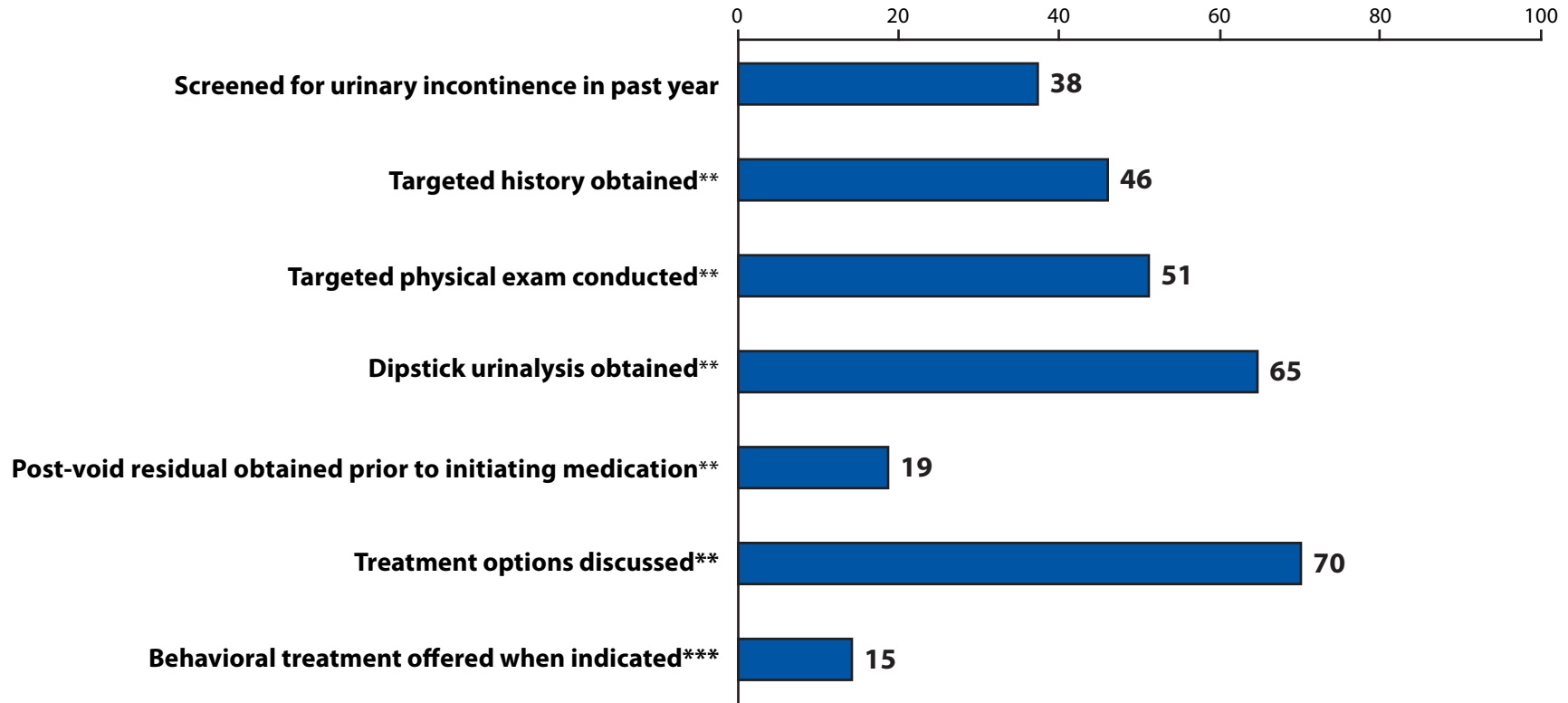
Implications: The findings of this study are consistent with other research indicating that UI in the elderly often goes undetected and is undertreated by primary care physicians (AHRQ 1996). A prior study investigating why physicians do not ask older patients about UI found a lack of time and patient embarrassment to be the most frequently reported reasons. Moreover, nearly three-quarters of physicians underestimated the proportion of older patients who could benefit from therapy and half said they did not feel prepared to treat this condition (CDC 1995). High priority should be placed on research to test and identify effective interventions that will help physicians improve their ability to detect and treat this problem, given its prevalence and consequences for the elderly.

* At-risk patients included those who screened positive for falls or fear of falling, bothersome incontinence, or memory impairment.

Urinary Incontinence: Screening and Management

Urinary incontinence (UI) affects many seniors and can lead to activity limitations, social isolation, and depression. Even when physicians recognized a patient as having UI, they often did not perform a complete history and physical exam or order recommended lab work. Although treatment options were often discussed, behavioral therapy was seldom offered.

Among at-risk patients* ages 75+ who were seen in two medical groups during 2000–2001, percentage whose care met expert standards



Source: Medical records from the Assessing Care of Vulnerable Elders (ACOVE-2) study (Wenger et al. 2005).
 *At-risk patients screened positive for falls or fear of falling, bothersome incontinence, or memory impairment (N = 644). **Among those with new or worsening urinary incontinence (UI) that persists for over one month or UI at the time of new evaluation. ***Among cognitively intact patients who are capable of independent toileting and have documented stress, urge, or mixed incontinence without evidence of hematuria or high post-void residual.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:19

Treatment for Depression

Why is this important? An estimated 2 million elderly Americans, or 6 percent of those ages 65 and older, suffer from a depressive illness and another 5 million, or 15 percent, experience depressive symptoms (NIMH 2003). Up to 25 percent of those with chronic illness suffer comorbid depression (DHHS 2000). Late-life depression is associated with increased use of health care and an increased risk of medical illness and suicide (Unutzer et al. 1997; Katon et al. 2003). Depressed elderly adults are less likely than younger or middle-age depressed adults to perceive that they need mental health care or to receive any specialty mental health care (Klap et al. 2003).

In recognition of the significant public health problem posed by depression in older adults, a National Institutes of Mental Health Consensus Panel recommended aggressive approaches to recognize, diagnose, and treat elderly individuals suffering from late life depression (NIH 1991; Lebowitz et al. 1997). The U.S. Preventive Services Task Force recommends depression screening for all adults in the primary care setting coupled with systematic depression treatment, including antidepressants and/or psychotherapy (USPSTF 2002c).

Findings: As part of a quality-improvement intervention at 18 primary care clinics across the United States, researchers identified and interviewed a sample of 1,801 adults ages 60 and older who met diagnostic criteria for major depression or dysthymia (chronic depressed

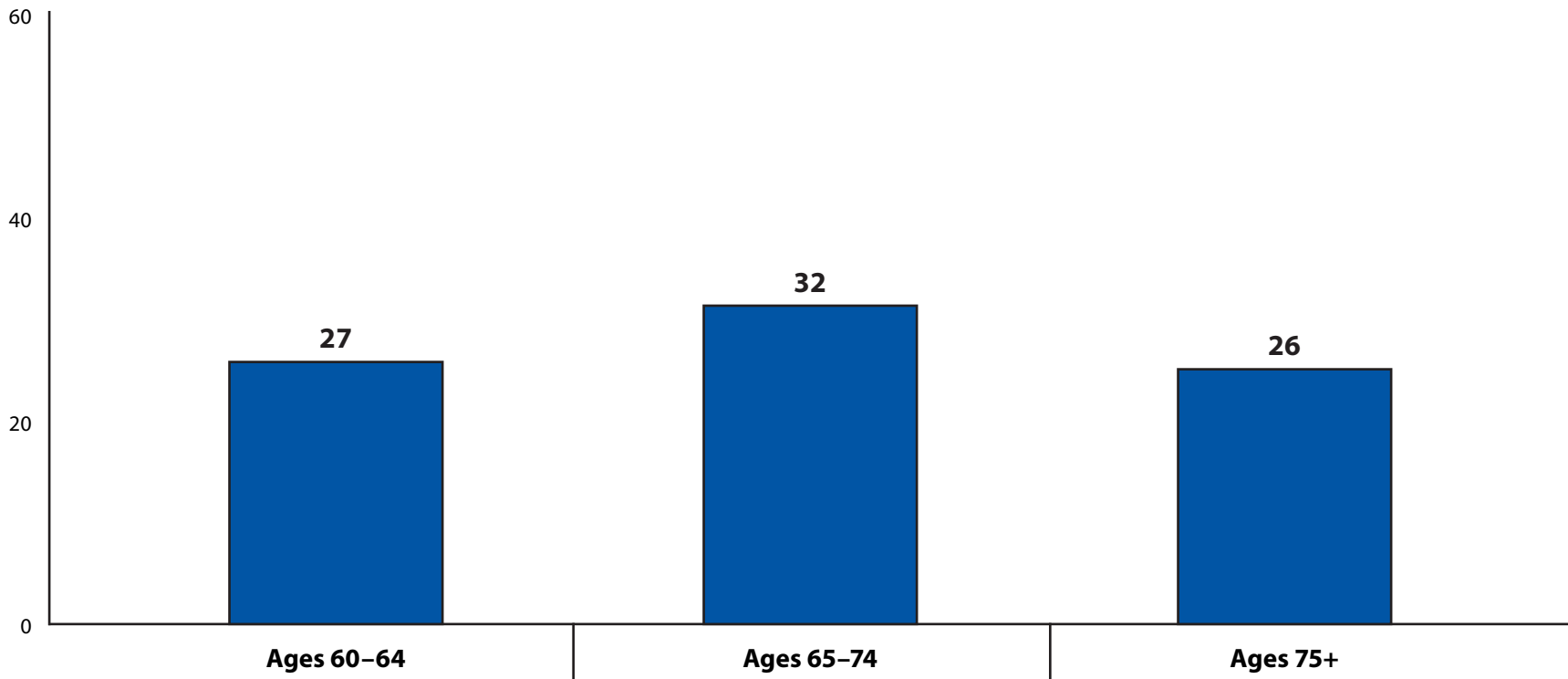
mood). Between 1999 and 2001, only 27 percent of those ages 60 to 64, 32 percent of those ages 65 to 74, and 26 percent of those ages 75 and older had received potentially effective recent treatment for depression (at least two months of antidepressant medication or four or more psychotherapy or counseling sessions within the past three months). Men, African Americans, Latinos, and those who preferred psychotherapy to medication reported significantly lower rates of recent depression care (data not shown) (Unutzer et al. 2003).

Implications: These data are consistent with other research indicating that depression is undertreated in the elderly (DHHS 2000). For example, only two-thirds of Medicare beneficiaries diagnosed with depression between 1992 and 1998 received *any* treatment for depression in the year that they were diagnosed (Crystal et al. 2003). Interventions that support effective depression treatment through primary care may be more acceptable to elderly patients than those that seek to facilitate referral to specialty care (Bartels et al. 2004). (See Chart 6:4 for a description of the intervention phase of this study, which substantially improved depression care and outcomes for these patients.)

Treatment for Depression

Among older patients of 18 clinics whom researchers determined had current major depression or dysthymia (chronic depressed mood), less than one-third had recently received treatment that experts would consider effective.

Among 1,801 patients of 18 clinics with current major depression or dysthymia, percentage who had received potentially effective recent treatment during 1999–2001*



Source: Patient interviews (Unutzer et al. 2003). *Potentially effective recent treatment means at least two months of antidepressant medication or four or more counseling or psychotherapy sessions for depression in past three months. Results may not be nationally representative.



EFFECTIVENESS • LIVING WITH ILLNESS • CHART 1:20

Mental Health Care in Managed Care Plans

Why is this important? Medical management of depression is often not optimal, whether patients are seen in primary care or by mental health specialists (Katz et al. 1998; Simon et al. 2001). Many patients who are started on an antidepressant medication do not complete therapy and do not have adequate follow-up with their physician to monitor medication safety and effectiveness. Response to medication may be slower in the elderly, requiring up to 12 weeks of therapy to achieve maximum effect and six months' continuation to prevent remission (NIH 1991; DHHS 2000). Patients who are treated in accordance with guidelines are less likely to experience a relapse in depression (Sood et al. 2000).

When an individual requires hospitalization for mental illness, it is important to provide follow-up care to support the transition back home and assure continued improvement (NCQA 2002). Because some individuals do not seek follow-up care on their own, reminder systems may be needed to proactively schedule such visits. The National Committee for Quality Assurance (NCQA) developed several measures of mental health care quality that are used by health care purchasers and regulators to monitor the performance of managed care plans on these topics.

Findings: Medicare beneficiaries in managed care plans often do not receive recommended outpatient medication management when diagnosed with depression and

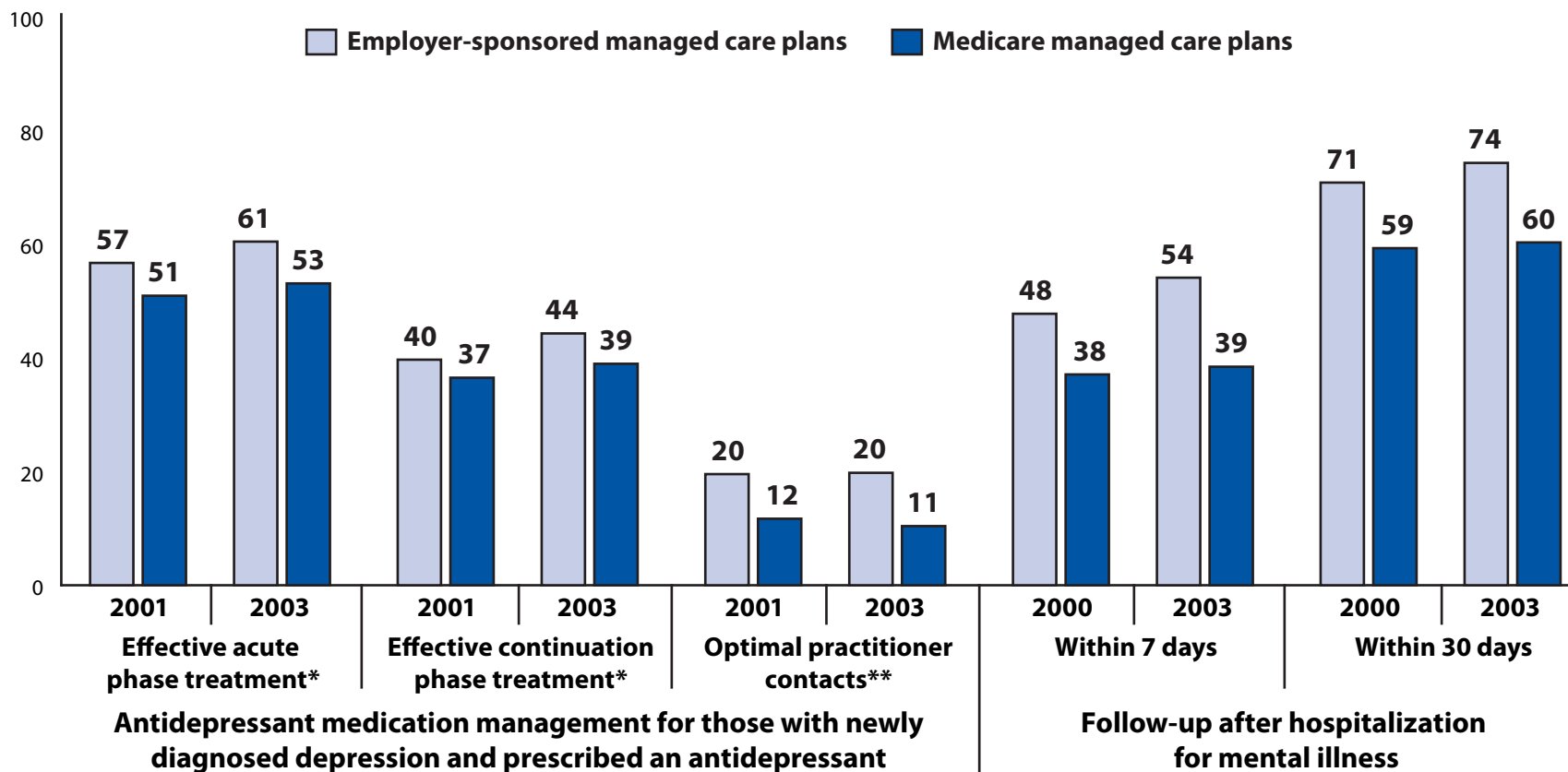
prescribed an antidepressant medication. In 2003, little more than half (53%) remained on their antidepressant during the 12-week acute treatment phase and less than two of five (39%) completed six-months of continuation phase treatment. Only one of 10 (11%) had at least three follow-up visits with their physician during the acute treatment phase. Similarly, only two of five (39%) of those hospitalized for a mental illness had follow-up within a week and only three of five (60%) within 30 days of being hospitalized. These rates of treatment did not improve much from 2001 to 2003 and were worse for Medicare than employer plan members (NCQA 2004).

Implications: There is no representative data such as this for patients outside of managed care plans and limited studies suggest that care is unlikely to be better. The differences between Medicare and employer plans probably reflects poorer mental health care for the elderly in general. The NCQA identifies mental health care as a weak spot that remains an exception to improvement seen in other areas of quality measurement and reporting by managed care plans (NCQA 2004). Some interventions have improved treatment adherence and patient outcomes and reduced relapse among patients who received telephonic and/or in-person support from an intermediate-level practitioner (Tutty et al. 2000; Katon et al. 2001).

Mental Health Care in Managed Care Plans

Medicare beneficiaries in managed care plans often do not receive recommended medication management when they have been diagnosed with depression and prescribed an antidepressant. Many do not receive timely follow-up after a hospitalization for mental illness. Rates did not improve much from 2000 or 2001 to 2003 and were worse for Medicare than employer plan members.

Percentage of eligible adult health plan members who received recommended care or achieved good outcomes



Source: HEDIS (NCQA 2004). *Those who continued using an antidepressant for 12 weeks after diagnosis (acute phase) or for six months after diagnosis (continuation phase). **At least three follow-up contacts during the 12-week acute phase.



EFFECTIVENESS • CHANGING NEEDS • CHART 1:21

Home Health Care Outcomes

Why is this important? In 2000, Medicare spent \$8.7 billion on home health care services for 2.5 million home-bound Medicare beneficiaries (GAO 2002b). Medicare reimburses home health agencies (HHAs) for episodes of care lasting no more than 60 days. Services must be provided in accordance with a physician's care plan and may include skilled nursing and aide services, physical and occupational therapy, speech pathology services, and medical social work. The goals of home health care are to “enable individuals to remain as functional and independent as possible in their own homes, thereby avoiding institutional long-term care” (CMS 2003).

As a condition of participation in Medicare, the 6,900 HHAs that contract with Medicare must undergo periodic quality assurance surveys, develop continuous quality-improvement programs, and collect standard patient assessment data called the Outcome Assessment and Information Set (OASIS). The Centers for Medicare and Medicaid Services (CMS) collects OASIS data in a national repository, which it uses to generate reports for home health agencies to use in quality-improvement activities. CMS publishes a subset of these outcomes on its Web site.

Findings: Functional outcomes for adult patients (ages 18 and older) served by Medicare-certified home health care agencies improved by 1 to 5 percentage points across nine publicly reported quality measures from

2002 to 2004 (AHRQ 2005b; CMS 2005a).^{*} Home health care agencies were more successful at improving some patient outcomes, such as healing wounds and pressure sores, than others such as medication management and urinary incontinence.

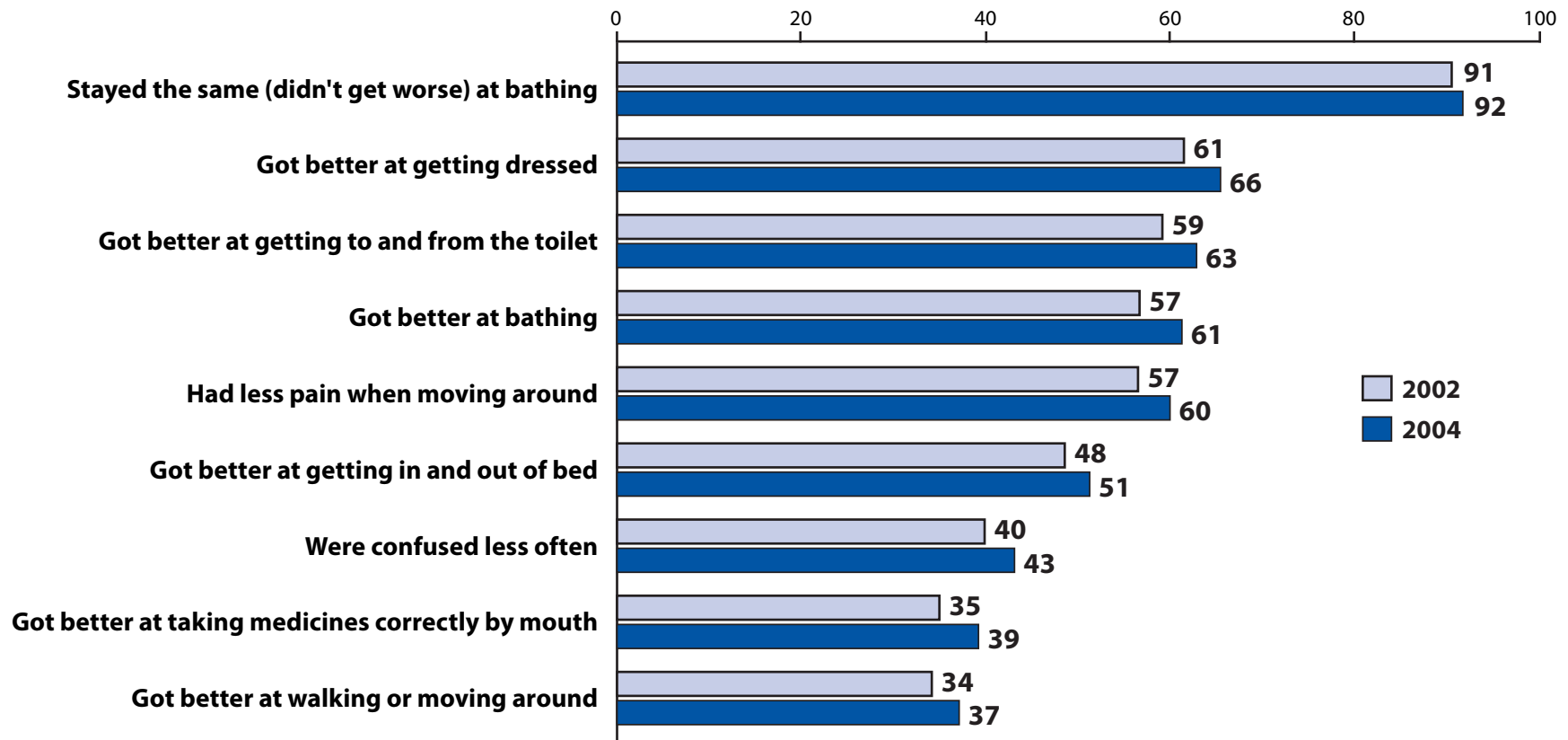
Implications: Because Medicare pays for much of the home health care delivered in the United States, it plays an important role in setting standards and expectations affecting quality. Home health quality assessment is challenging given that there are no accepted standards for the processes of care that should be delivered and the fact that different care providers may work independently within each patient's home. Outcomes assessment and reporting provides one way to monitor and encourage improvements in the quality of home health care and may be especially important given the incentives for undertreatment inherent in Medicare's prospective payment system (MedPAC 2004a). (See Chart 6:6 for an example and discussion of Medicare's Outcome-Based Quality Improvement system for home health care.)

^{*} The data shown in the chart represent adult patients who received skilled care from Medicare-certified home health agencies and whose care was paid for by Medicare or Medicaid. It does not include patients who received maternity services or who received only personal care.

Home Health Care Outcomes

There was a trend toward improvement in functional outcomes for home health care patients across multiple measures from 2002 to 2004. Patients tend to improve more for some types of outcomes, such as toileting, than for others, such as ambulation.

Percentage of patients ages 18+ cared for by Medicare-certified home health care agencies who:



Source: Outcome and Assessment Information Set (OASIS). Data for 2002 were reported by the Agency for Healthcare Research and Quality (2005b). Data for 2004 were reported by the Centers for Medicare and Medicaid Services (2005a) Home Health Compare Web site. Measures shown represent a subset of functional outcomes measured for which results were publicly reported for both 2002 and 2004.



EFFECTIVENESS • MULTIPERSPECTIVE • CHART 1:22

State-Level Performance on Medicare Quality Indicators

Why is this important? Medicare launched a Health Care Quality Improvement Program in the 1990s to promote the widespread adoption of professionally developed, evidence-based standards of care (Jencks and Wilensky 1992). The Medicare program contracts with Quality Improvement Organizations (QIOs), formerly called Peer Review Organizations, that work with health care providers in every state “to systematically promote improved performance on the quality measures tracked under this program using a voluntary, collaborative, and nonpunitive educational strategy” (Jencks et al. 2000). QIOs provide quality improvement strategies, pretested educational materials, a forum for collaboration, and customized technical assistance free of charge to participating Medicare providers (CMS 2000b). (See the Introduction for additional background on this topic.)

Findings: During 2000–2001, northern and less populous states tended to perform better across 22 indicators of the effectiveness of care delivered to Medicare beneficiaries, including preventive care and/or treatment for heart attack, heart failure, stroke, pneumonia, influenza, diabetes, and breast cancer (see Appendix Table 1a for a list of indicators and national rates of performance on each indicator). From 1998–1999 to 2000–2001, the median state’s performance across the 22 indicators improved from 69.5 percent to 73.4 percent, representing a 12.8 percent relative improvement* (Jencks et al. 2003).

Implications: The median relative improvement represents one measure of the degree to which the quality gap—the difference between actual and ideal performance—was reduced. Twelve of 13 states in the highest quartile of performance in 2000–2001 also ranked higher (first or second quartile) in relative improvement. In contrast, 10 of 12 states in the lowest quartile of performance in 2000–2001 also ranked lower (third or fourth quartile) in relative improvement. With leadership and commitment, health care providers in poorly performing states may be able to emulate methods used in better-performing states to develop a stronger infrastructure for improvement.

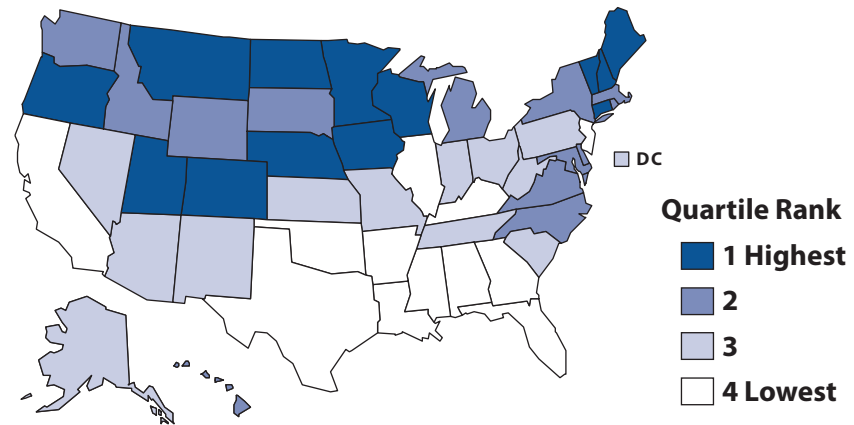
The federal government has proposed that QIOs work more intensively with Medicare providers to achieve significant performance improvement in several areas during the next three years (CMS 2004c). More than 4,000 U.S. hospitals have volunteered to participate in the Hospital Quality Alliance, a public-private partnership that is reporting participants’ performance on 17 quality indicators, which may provide further incentive for improvement (CMS 2005b).

* Relative improvement was measured as absolute change / (100 - baseline). The Medicare Quality Improvement Organization program included 24 quality indicators but two indicators measuring time to reperfusion were excluded from the state rankings described in this chart.

State-Level Performance on Medicare Quality Indicators

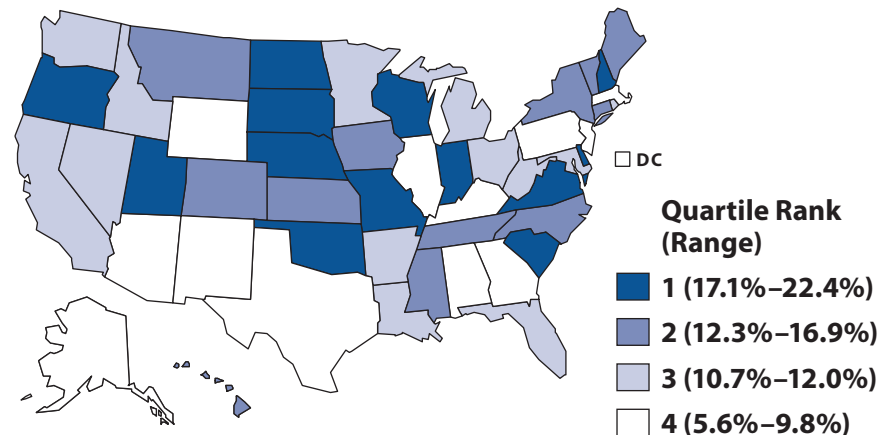
Average state performance on provision of effective care to Medicare fee-for-service beneficiaries, by quartile rank, 2000–2001

Northern and less populous states tended to perform better across 22 indicators of the quality of care delivered to Medicare beneficiaries, including preventive care and/or treatment for heart attack, heart failure, stroke, pneumonia, influenza, diabetes, and breast cancer (see Appendix Table 1a for a list of the indicators included in this ranking).



Median relative improvement* in the provision of effective care to Medicare fee-for-service beneficiaries, by quartile rank

From 1998–1999 to 2000–2001, the median state's performance across the 22 quality indicators improved from 69.5 percent to 73.4 percent, representing a 12.8 percent relative improvement.* This is a measure of the degree to which the gap between actual and ideal performance was reduced.



Source: Center for Medicare and Medicaid Services, Medicare Quality Improvement Organization program (Jencks et al. 2003). Adapted and used with permission from: *Journal of the American Medical Association*, Jan. 15, 2003, 289: 310-11. Copyrighted © 2003, American Medical Association. All Rights reserved.

*Relative improvement was defined as absolute change / (100 - baseline).



EFFECTIVENESS • MULTIPLE CONDITIONS • CHART 1:23

Assessing Care of Vulnerable Elders

Why is this important? More than one-third (36%) of national health care expenditures goes toward the care of the elderly (Keehan et al. 2004), yet little is known about the quality of care that these patients receive for common geriatric problems. As older persons begin to decline functionally, they typically place the greatest priority on maintaining functional ability and quality of life (Phillips et al. 1996), yet studies of this population tend to focus on general medical conditions and longevity. The Assessing Care of Vulnerable Elders (ACOVE) project used an expert-consensus process to develop a system for comprehensively assessing quality of care across 22 target conditions that are important to the well-being of vulnerable elders in the community. This system uses 236 expert-validated quality indicators covering screening and prevention, diagnosis, treatment, and follow-up and continuity of care (Wenger et al. 2003).

Findings: Two managed care organizations participated in an ACOVE pilot study that assessed the care provided during 1998–1999 to vulnerable elders ages 65 and older at risk for functional decline or death. The care provided to these patients met only 55 percent of the 236 quality indicators and varied widely across conditions, ranging from a high of 82 percent for stroke care to a low of 9 percent for care at the end of life. Quality indicators for geriatric conditions were met less frequently than those for general medical conditions (31% vs. 52%).

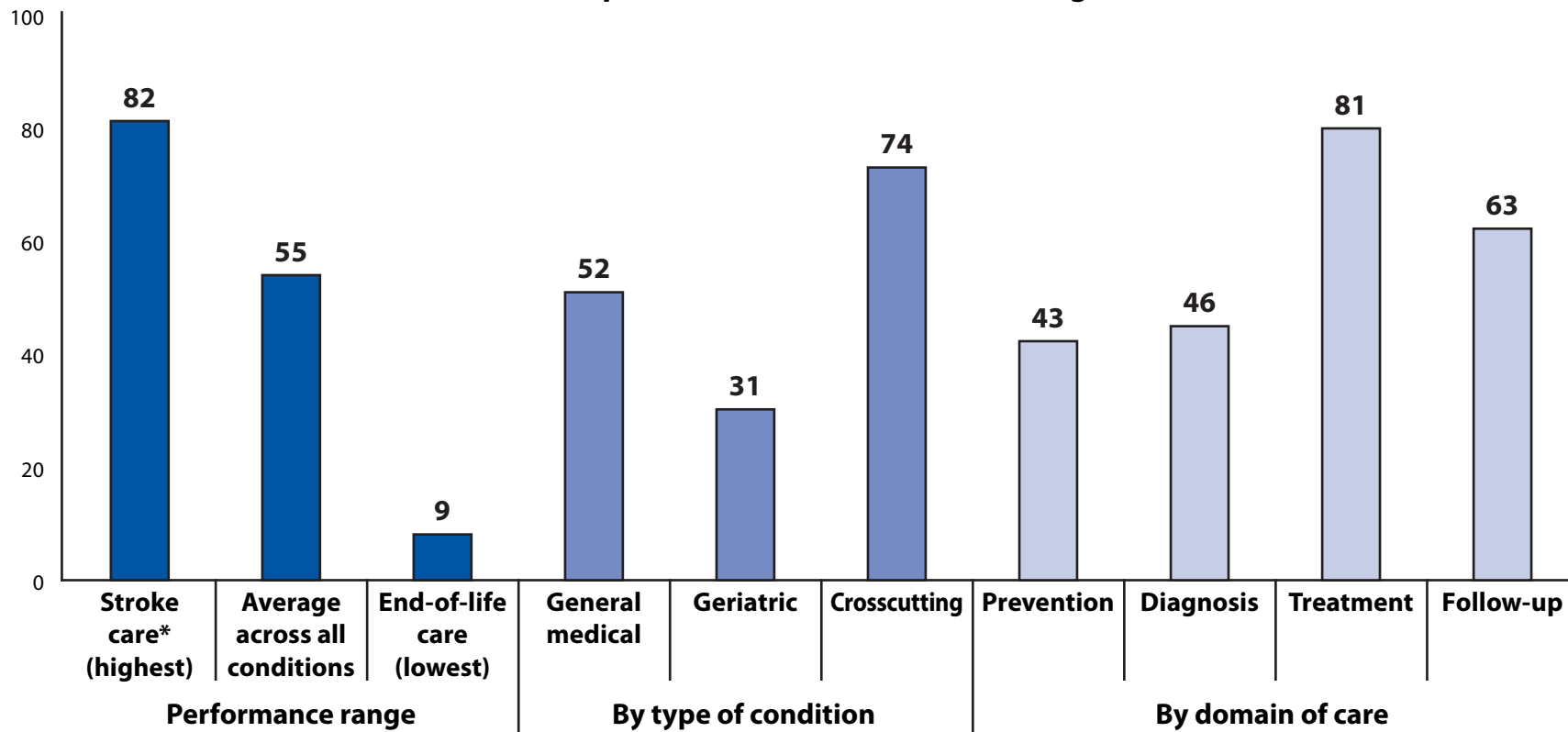
Although treatment-related quality was high (81% of indicators met), recommended processes of care related to prevention and diagnosis were attained less than half of the time (43% and 46%, respectively) (Wenger et al. 2003).

Implications: Although this study was limited to a small population, it provides a caution that the quality of care for vulnerable elders is often suboptimal. The finding that quality of care for geriatric conditions, such as dementia and urinary incontinence, is poorer than care for general medical conditions calls into question whether the quality indicators in widespread use today are sufficient to assure high-quality care for the elderly. Based on these findings, a series of interventions is being tested in community medical groups to improve performance on a subset of the worst-performing geriatric conditions (urinary incontinence, falls, and dementia). Results from these interventions will help guide the development of physician and patient educational materials and tools designed to facilitate better care of the growing vulnerable older population (Reuben et al. 2003b; Wenger et al. 2005).

Assessing Care of Vulnerable Elders

In a pilot study in two health plans, the quality of care provided to vulnerable elders—those at higher risk for functional decline or death—met expert standards only a little more than half the time. The greatest gaps in quality occurred in the care of geriatric conditions and in preventive care.

Percentage of eligible vulnerable elders ages 65+ in two health plans whose care met expert-determined standards during 1998–1999



Source: Assessing Care of Vulnerable Elders (ACOVE-1) indicators applied to patient interviews or medical records (Wenger et al. 2003). Vulnerable elders were defined as community-dwelling persons ages 65+ who have four times the risk for functional decline or death over the next two years (N = 420).

*Stroke care category also includes care for patients with atrial fibrillation.





SECTION 2

Patient Safety

Patient safety means “avoiding injuries to patients from the care that is intended to help them.” – Institute of Medicine 2001a

PATIENT SAFETY • CHART 2:1

Adverse Events and Postoperative Complications of Care

Why is this important? The Institute of Medicine reported in 1999 that thousands of Americans are harmed each year from the health care that is intended to help them (IOM 1999). The IOM called upon all concerned stakeholders to take specific actions to improve patient safety. Other high-risk industries, such as aviation and nuclear power, do not depend on human perfection to achieve high levels of safety. Rather, they design “fault-tolerant” systems that prevent harm by taking account of the human propensity for error (Reason 1997). Such an approach seeks information on system vulnerabilities so that they can be proactively mitigated and eliminated.

The Medicare Patient Safety Monitoring System (MPSMS) is a nationwide surveillance program intended to help achieve this goal for the Medicare program. The MPSMS uses explicit (structured and objective) review of hospital medical records and administrative data to determine rates of specific adverse events of importance to the Medicare population. An adverse event is defined as an “unintended harm, injury, or loss that is more likely associated with [the patient’s] interaction with the health care delivery system than from an attendant disease process” (Hunt et al. 2004).

Findings: Among Medicare fee-for-service beneficiaries hospitalized during 2002, the rates of 11 high-priority adverse events ranged from a high of 22.6 percent of patients who experienced postoperative complications

of hip joint replacement surgery (when done following a fracture) to a low of 0.4 percent of all hospital patients who experienced a hospital-acquired bloodstream infection (AHRQ 2005b).*

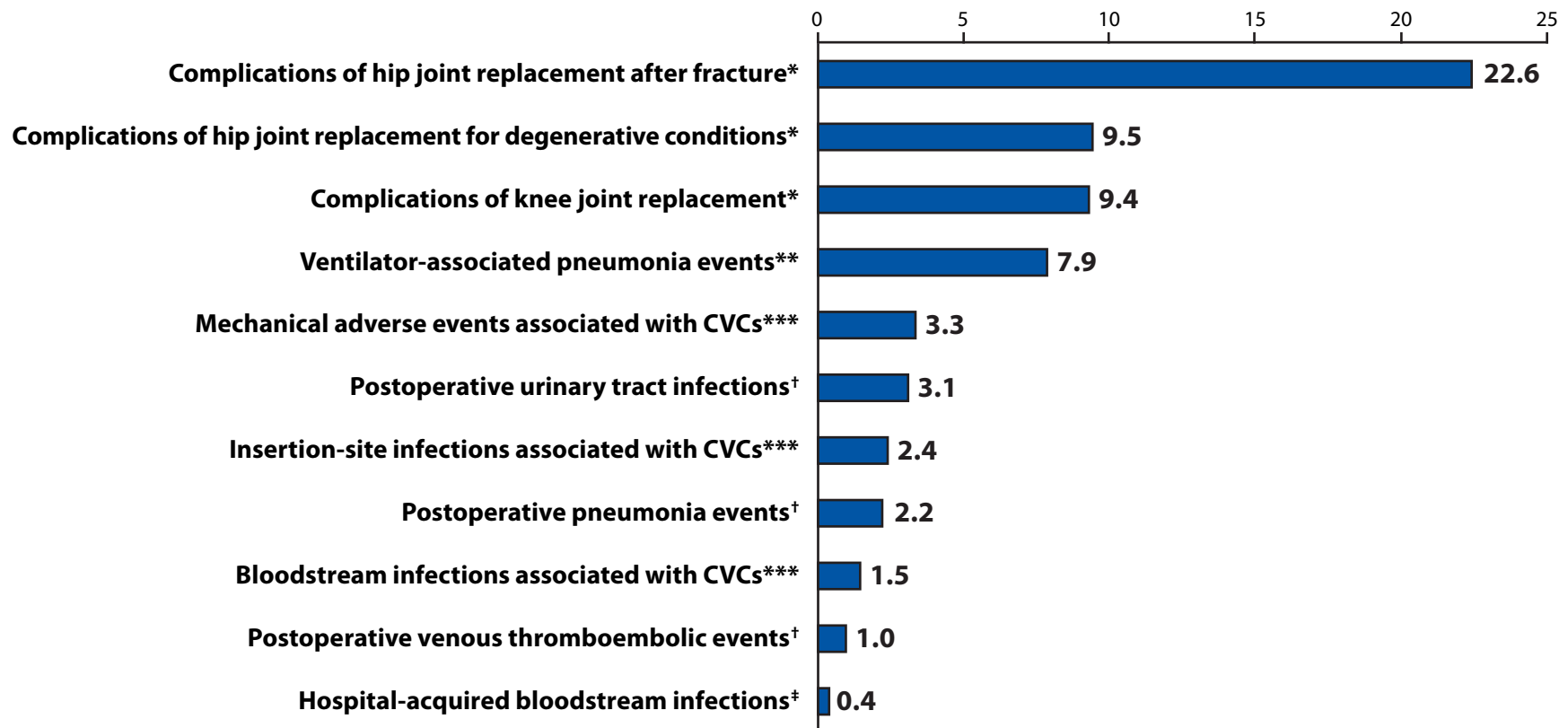
Implications: A patient-oriented approach to patient safety recognizes that the patient’s ultimate concern is freedom from harm. “Physicians and organizations should strive to prevent or mitigate situations that actually cause harm to patients, whether the harm is caused by an error or a faulty or inefficient process,” says patient safety expert Roger Resar, M.D. (quoted by Neveleff 2003). The occurrence of some adverse events is related, at least in part, to patients’ underlying conditions and the risk inherent in some treatments. Nevertheless, the experience of anesthesiology and of several health care organizations shows that adverse events can be dramatically reduced and in some cases eliminated by creating systems that reliably provide evidence-based treatment, encourage proactive nursing care, and promote good teamwork and communication (Gaba 2000; Khuri et al. 2002; Schoeni 2002; Bellomo et al. 2003; Pronovost and Berenholtz 2004).

* These rates of adverse events are not directly comparable to those reported in Charts 2:2 and 2:3 because of differences in methods and data sources.

Adverse Events and Postoperative Complications of Care

Medicare began a national program of monitoring adverse events and complications of hospital care in 2002. Although the occurrence of these events is related in part to patients' underlying conditions, many might be preventable with good medical and nursing care.

Percentage of fee-for-service Medicare hospital patients at risk who experienced selected adverse events or complications of care in 2002



Source: Medicare Patient Safety Monitoring System (AHRQ 2005b). These data are based on explicit reviews of medical records and are not directly comparable to data shown in Charts 2:2 and 2:3 because of differences in methods and sources. *Among patients who had the indicated surgery. **Among patients who were on a ventilator. ***Among patients in whom a central venous catheter (CVC) was inserted. †Among all surgical patients. ‡Among all hospital patients. See Technical Appendix for definitions.



PATIENT SAFETY • CHART 2:2

Trends in Adverse Events and Complications of Care in the Hospital

Why is this important? The Institute of Medicine's 1999 report, *To Err is Human*, prompted national efforts to diminish threats to patient safety (IOM 1999). Before the IOM report, few tools and very little data were available to understand and monitor the scope and types of safety problems affecting patients. As one response, the federal Agency for Healthcare Research and Quality created Patient Safety Indicators, which use hospital billing records to “screen for problems that patients experience as a result of exposure to the healthcare system, and that are likely amenable to prevention by changes at the system or provider level” (AHRQ 2003b).

Findings: Medicare fee-for-service beneficiaries hospitalized during 2000 experienced more than 325,000 potentially preventable adverse events and complications of care identified by 13 Patient Safety Indicators. The risk-adjusted rate of adverse events increased for nine of the 13 indicators from 1995 to 2002 (only the top 10 are shown on the chart, excluding “failure to rescue”). For example, the rate of pressure sores during a hospital stay of five days or longer increased by 35 percent (absolute increase of 82 per 10,000 discharges). On the other hand, the rate of hip fractures following surgery decreased by 28 percent (absolute decrease of 5 per 10,000 discharges) (MedPAC 2004c).

Implications: These findings suggest that adverse events might be increasing or that they are more often being recorded in hospital billing records. Another analysis using 18 Patient Safety Indicators applied to hospitalizations for the entire U.S. population estimated that potentially preventable adverse events accounted for 2.4 million additional hospital days, 32,600 deaths, and \$4.6 billion in additional cost to the health care system (Zhan and Miller 2003).

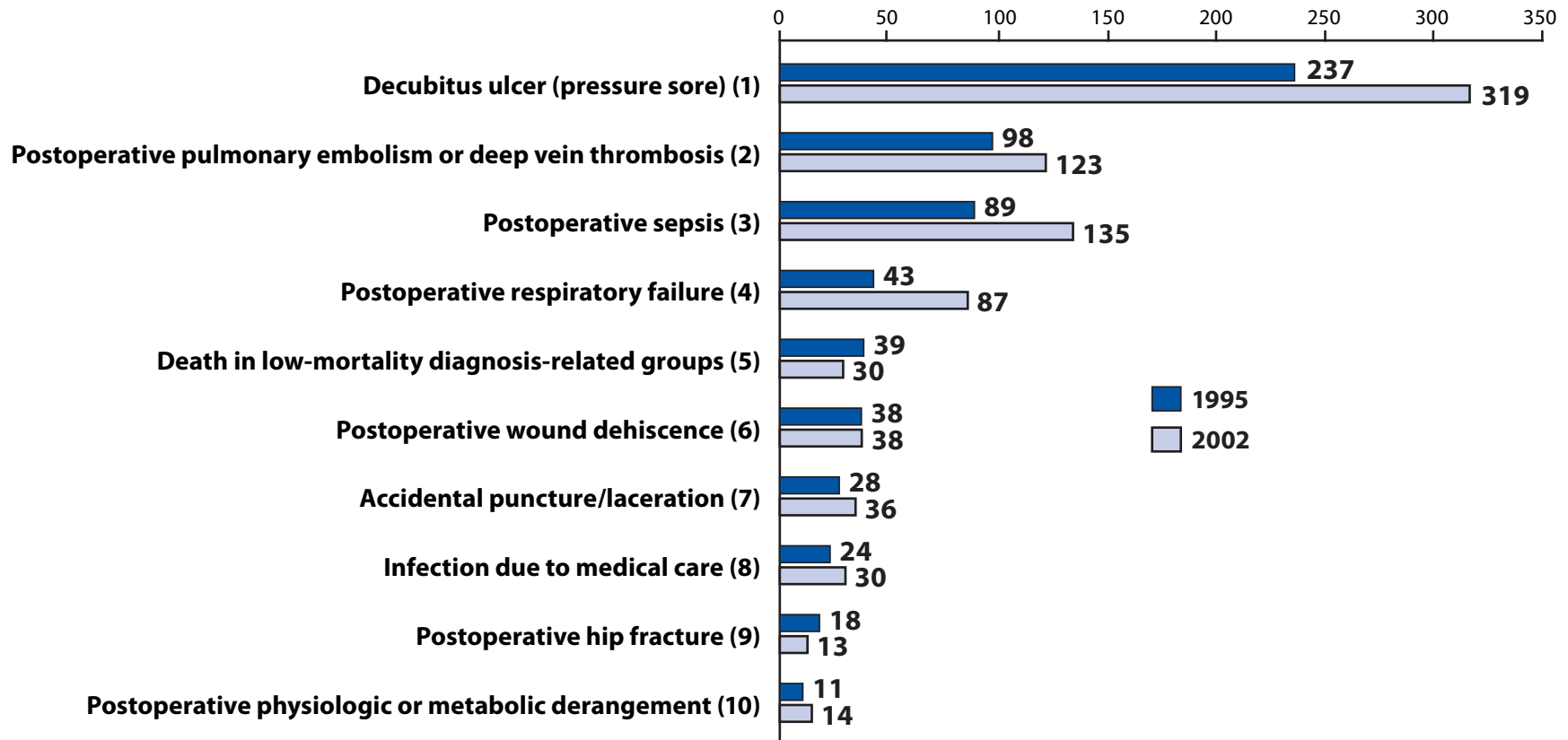
The findings shown in the chart are not definitive because of the limitations of the administrative data on which they are based. The increase in some rates could be caused, in part, by improved accuracy or changes in coding, such as the introduction in 1998 of a new code for acute and respiratory failure. However, experts told staff of the Medicare Payment Advisory Commission that changes in coding were unlikely to account for other observed increases (MedPAC 2004c).

The trends identified in this analysis deserve ongoing monitoring and further investigation. Individual hospitals might use such information to help identify areas where process improvement is needed and develop effective strategies that promote better organization, training, procedures, teamwork, and communication to increase patient safety.

Trends in Adverse Events and Complications of Care in the Hospital

Rates of several potentially preventable adverse events and complications of hospital care increased from 1995 to 2002 among Medicare fee-for-service beneficiaries, and/or they were more often recorded in hospital billing records.

Risk-adjusted rates of potentially preventable adverse events and complications of care (per 10,000 Medicare fee-for-service beneficiaries discharged from the hospital)*



Source: Medicare Payment Advisory Commission (2004c) analysis of Medicare administrative data using AHRQ Patient Safety Indicators. Only the 10 highest rates (other than “failure to rescue”) are shown. Rates exclude complications present on admission and are adjusted for age, gender, age-gender interactions, comorbidities, and diagnosis-related group clusters. *See Technical Appendix for footnotes defining the population at risk for each measure.



PATIENT SAFETY • CHART 2:3

Adverse Events and Complications of Care in the Hospital, by Patient Age

Why is this important? Because the elderly generally use more health care services than other age groups, they are more often exposed to potential patient safety threats (Thomas and Brennan 2000). Adverse events such as falls are more frequent and their consequences may be more severe among the elderly (Rothschild et al. 2000). Understanding the incidence of adverse events in the elderly might help hospitals appreciate the scope of these problems and investigate how they can reliably employ preventive strategies to help reduce their occurrence. For example:

- Infections associated with intravenous lines and catheters can be reduced or prevented by using simple tools such as checklists and a standardized supply cart to ensure compliance with the CDC's infection control guidelines and by asking daily during patient rounds whether catheters can be removed (Berenholtz et al. 2004).
- Formation of blood clots in the leg (deep vein thrombosis), which may travel to and become lodged in the lungs (pulmonary embolism), is often preventable if providers follow recommendations of the American College of Chest Physicians for use of anticoagulants, compression stockings, and pneumatic compression devices (Geerts et al. 2004).
- Pressure sores may be preventable with interventions such as regular skin assessments, turning schedules, pressure reduction devices, and nutritional supplements (AHRQ 1992). Using prevention protocols and making system improvements reduced the incidence of pressure sores by up to two-thirds in some studies (Bergstrom 1997).

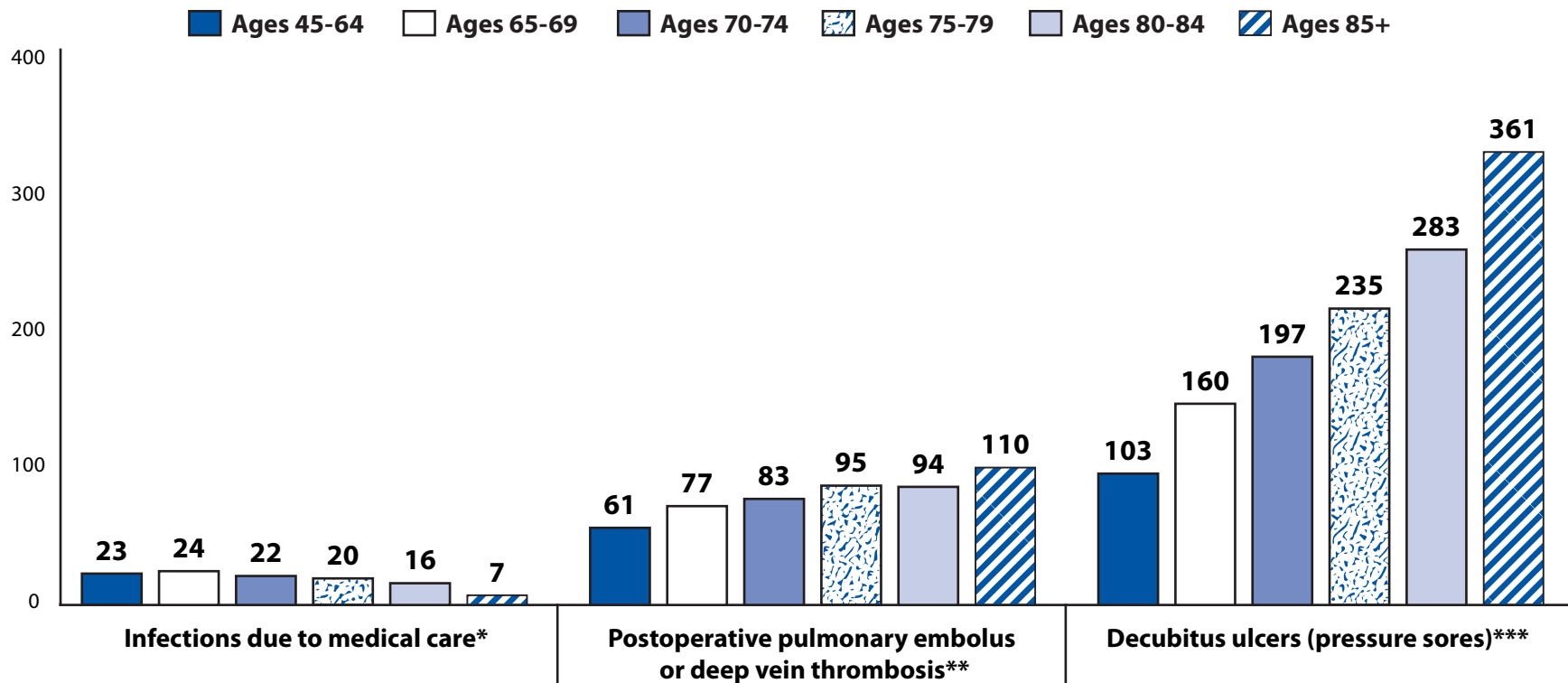
Findings: According to an analysis that applied Patient Safety Indicators to a national sample of hospitalizations during 2001, the oldest old, as compared to middle-age adults, were less likely to develop infections attributable to intravenous lines or catheters, almost twice as likely to experience deep vein thrombosis or pulmonary embolism, and over three times more likely to suffer from pressure sores during long hospital stays (AHRQ 2005b).

Implications: A review of research concluded that “[t]he main cause of these increased risks [to the elderly] appears to be the diminished physiological reserve of elderly patients; however, age alone is a less important predictor of adverse events than comorbidities and functional status” (Rothschild et al. 2000). Patient safety experts recommend that hospitals promote a culture of safety, apply human factors principles to minimize error through work design, consider the potential benefits of geriatric specialists and geriatric care units to improve care, and perform a comprehensive geriatric assessment at admission to predict risk of complications.

Adverse Events and Complications of Care in the Hospital, by Patient Age

This chart focuses on three adverse events or complications of care that can often be prevented with good medical and nursing care. The oldest old, as compared to middle-age adults, are less likely to develop infections attributable to intravenous lines or catheters in the hospital, almost twice as likely to have postoperative blood clots form in their legs and/or travel to their lungs, and over three times more likely to experience pressure sores during long hospital stays.

Risk-adjusted rates of potentially preventable adverse events and complications of care (per 10,000 hospital patients discharged in 2001)



Source: Patient Safety Indicators applied to Health Care Utilization Project Nationwide Inpatient Sample (AHRQ 2005b). Rates exclude complications present on admission and are adjusted for gender, comorbidities, and diagnosis-related group clusters. *Infections primarily related to intravenous lines and catheters. **Among surgical patients. ***Among patients with hospital stays of five days or longer. See the Technical Appendix for specific exclusions.



PATIENT SAFETY AND TIMELINESS • CHART 2:4

Appropriate Use of Antibiotics to Prevent Surgical Infections

Why is this important? About three of every 100 operations performed in the United States are complicated by surgical site infections (SSIs) (Gaynes et al. 2001). Compared with uninfected patients, patients developing SSIs are twice as likely to die, are over five times more likely to be readmitted to the hospital, spend an additional 6.5 days in the hospital, and incur more than \$3,000 in excess direct health care costs (Kirkland et al. 1999). The Centers for Medicare and Medicaid Services and the Centers for Disease Control and Prevention partnered in 2002 to form the National Surgical Infection Prevention Project. The project promotes evidence-based use of prophylactic antibiotics to reduce the risks of SSI, antibiotic complications, and bacterial drug resistance (Bratzler and Houck 2004). These practices include treating patients with appropriate (relatively narrow-spectrum) antibiotic drugs, giving antibiotics within one hour of surgical incision, and discontinuing antibiotic prophylaxis within 24 hours after surgery (CMS 2003; Bratzler et al. 2005).

Findings: A nationwide review of the medical records of fee-for-service Medicare patients who underwent one of five types of major surgery in 2001 found that nearly all patients received prophylactic antibiotics. Most (93%) of these patients received a relatively narrow-spectrum antibiotic drug consistent with guidelines. The appropriate timing of antibiotic administration was poor:

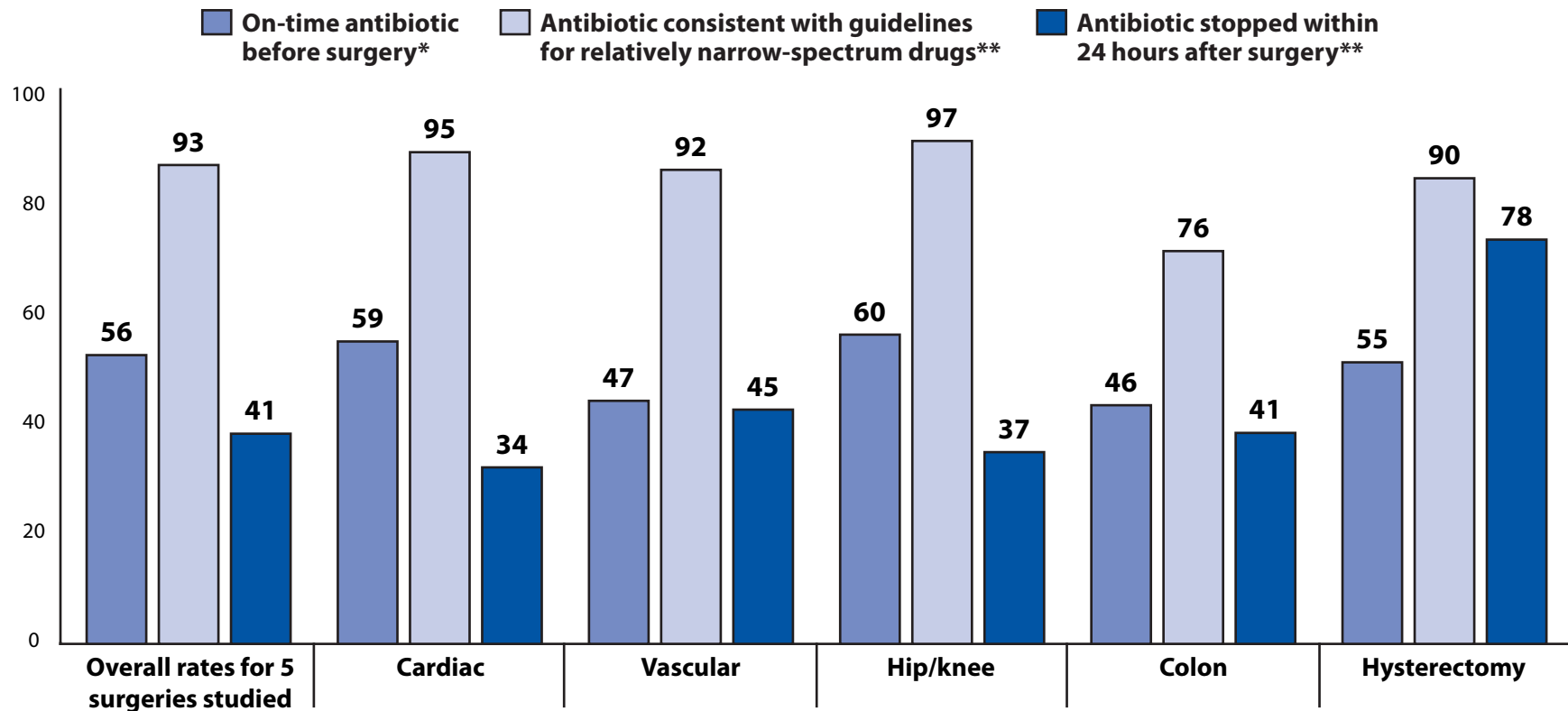
only a little more than half (56%) of patients were given antibiotics within one hour before surgical incision, and less than half (41%) had prophylaxis discontinued within 24 hours after surgery. Nearly 10 percent of patients received their first antibiotic dose more than four hours after surgical incision, which is too late to provide a benefit. The median time to antibiotic discontinuation was more than 40 hours versus the recommended 24 hours (Bratzler et al. 2005).

Implications: Improvement is needed in SSI prevention practices for about half of patients undergoing major surgery. Higher rates of timely antibiotic administration before surgery might be associated with more frequent use of preprinted care plan forms that include antibiotic protocols. The Surgical Care Improvement Project, a national partnership of organizations seeking to improve surgical care by reducing postoperative complications, is launching a five-year campaign to reduce the incidence of surgical complications by 25 percent by the year 2010. A collaboration among Medicare Quality Improvement Organizations at 56 medical centers across the country achieved a 27 percent reduction in SSIs using evidence-based practices such as these, according to preliminary findings (SCIP 2004).

Appropriate Use of Antibiotics to Prevent Surgical Infections

Surgical site infections substantially increase the use of health care resources and the risk of patient death. Many Medicare patients undergoing surgery in 2001 did not receive antibiotics in a manner consistent with evidence about how to effectively prevent postoperative infections while minimizing the risk of spreading antibiotic resistance.

Among fee-for-service Medicare hospital patients undergoing selected surgeries during 2001, percentage who received antibiotics consistent with evidence-based standards



Source: Centers for Medicare and Medicaid Services, National Surgical Infection Prevention Project, review of medical records (Bratzler et al. 2005). *Prophylactic antibiotic given within one hour prior to surgical incision. **Among patients who were given prophylactic antibiotics.



PATIENT SAFETY • CHART 2:5

Potentially Inappropriate Prescribing for the Elderly

Why is this important? Inappropriate use of medications in circumstances when risks outweigh benefits poses harm to patients and is wasteful of health care resources. Inappropriate medication use is a particular concern among the elderly. The elderly are often more physiologically vulnerable and tend to use a greater number of medications (Kaufman et al. 2002), which puts them at risk for potentially harmful drug-drug and drug-disease interactions (Zhan et al. 2005).

To address this problem, experts have developed lists of medications that are inappropriate to use in older adults because they may cause harm or have limited effectiveness. The most widely used list is the Beers criteria (Beers 1997; Fick et al. 2003). Some evidence suggests that use of these drugs by the elderly can lead to adverse health outcomes and increased use of health care resources (Chin et al. 1999; Fick et al. 2001; Fu et al. 2004). Another expert panel refined the Beers list to distinguish drugs that should always be avoided in the elderly (Zhan et al. 2001).

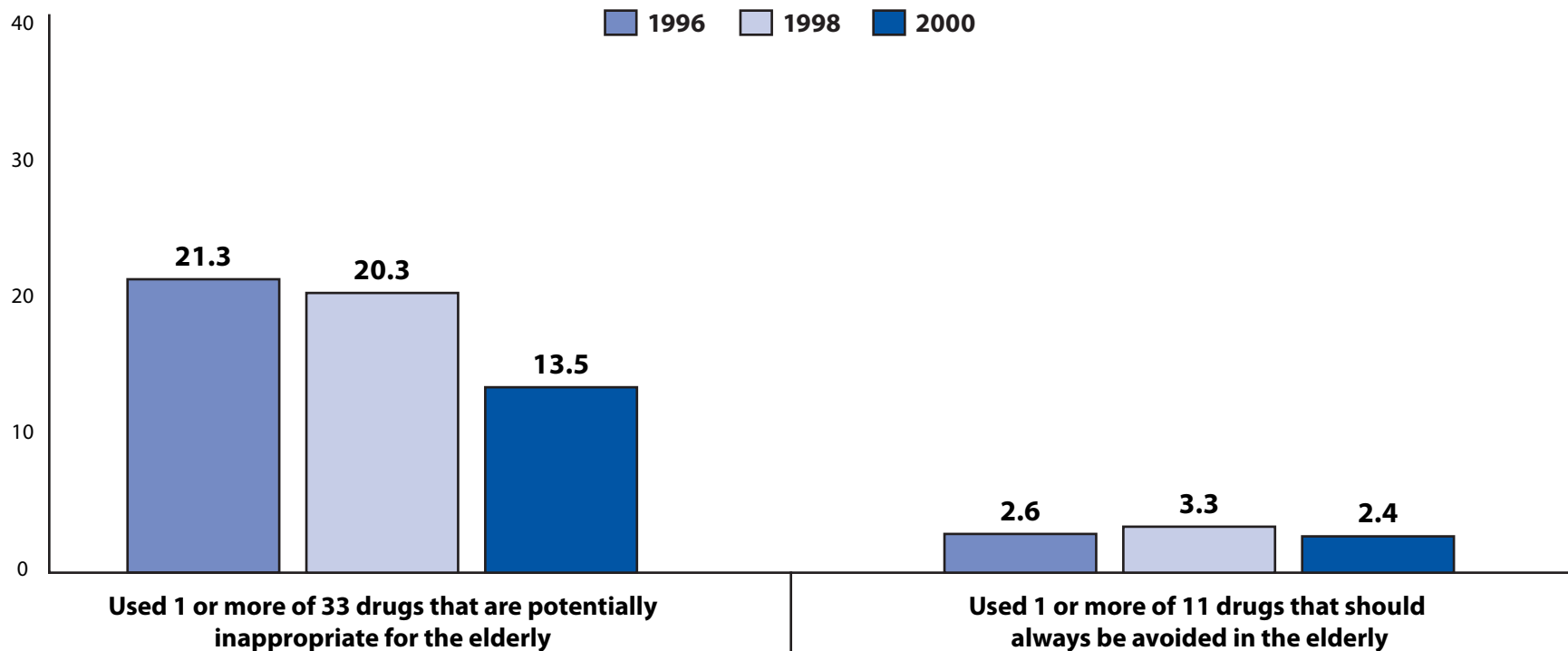
Findings: Applying expert criteria to a national sample of community-dwelling adults revealed that the proportion of elderly ages 65 and older who had used one or more potentially inappropriate drugs declined by more than one-third, from 21.3 percent in 1996 to 13.5 percent in 2000. The proportion using drugs that should always be avoided changed little from 1996 to 2000, ranging from 2 to 3 percent (AHRQ 2005b).

Implications: These results imply that about 4.7 million community-dwelling elderly individuals received at least one of 33 potentially inappropriate medications in 2000, and that about 840,000 received one of 11 drugs that should always be avoided by elderly patients. The downward trend in prescription of potentially inappropriate drugs suggests that physicians are heeding concerns for more careful prescribing to the elderly. As important as minimizing medication overuse is for the elderly, failing to prescribe recommended medications and to provide adequate patient education and medication monitoring may be even more significant issues, according to the Assessing Care for Vulnerable Elders (ACOVE) Study (Higashi et al. 2004) (see Chart 2:6).

Potentially Inappropriate Prescribing for the Elderly

Some prescription drugs should often be avoided in the elderly because they can cause harm or have questionable effectiveness for certain conditions. The proportion of elderly adults who were using one of these drugs declined by one-third from 1998 to 2000. Two to three percent of seniors were taking a drug that experts agree should never be used in the elderly.

Percentage of community-dwelling elderly adults (ages 65+) who reported taking at least one prescription drug that is potentially inappropriate for the elderly



Sources: 1997 Beers criteria and Zhan expert criteria applied to the Medical Expenditure Panel Survey (AHRQ 2004; 2005b).



PATIENT SAFETY • CHART 2:6

Preventable Adverse Drug Events in Ambulatory Care

Why is this important? Research indicates that 90 percent of all community-dwelling adults ages 65 and older take at least one medication per week, more than 40 percent use five or more different medications per week, and 12 percent use 10 or more different medications per week (Kaufman et al. 2002). Given this extensive use of medications, adverse drug events (harm from medication) are a serious concern. Up to one-quarter of hospitalized patients experience an adverse drug event (Rozich et al. 2003) and about one-third of these events are associated with preventable medication errors (Kanjanarat et al. 2003). Little is known about the incidence or preventability of adverse drug events among elderly patients in the ambulatory setting, where the majority of health care is provided.

Findings: Analysis of a group of more than 30,000 Medicare beneficiaries cared for in a large multispecialty group practice during a 12-month period identified 1,523 adverse drug events (a rate of 50 per 1,000 person-years of enrollment). Of these, 28 percent (421) were considered preventable by researchers at either the provider or the patient level. About 60 percent of the preventable adverse events were associated with prescription and monitoring errors. More than 20 percent were related to patient adherence such as taking the wrong dose, failing to take prescribed medication, or failing to stop taking medication when instructed. A separate analysis (not

shown) found that 38 percent (578) of the adverse events were serious, life-threatening, or fatal; 42 percent of these were deemed preventable (Gurwitz et al. 2003).

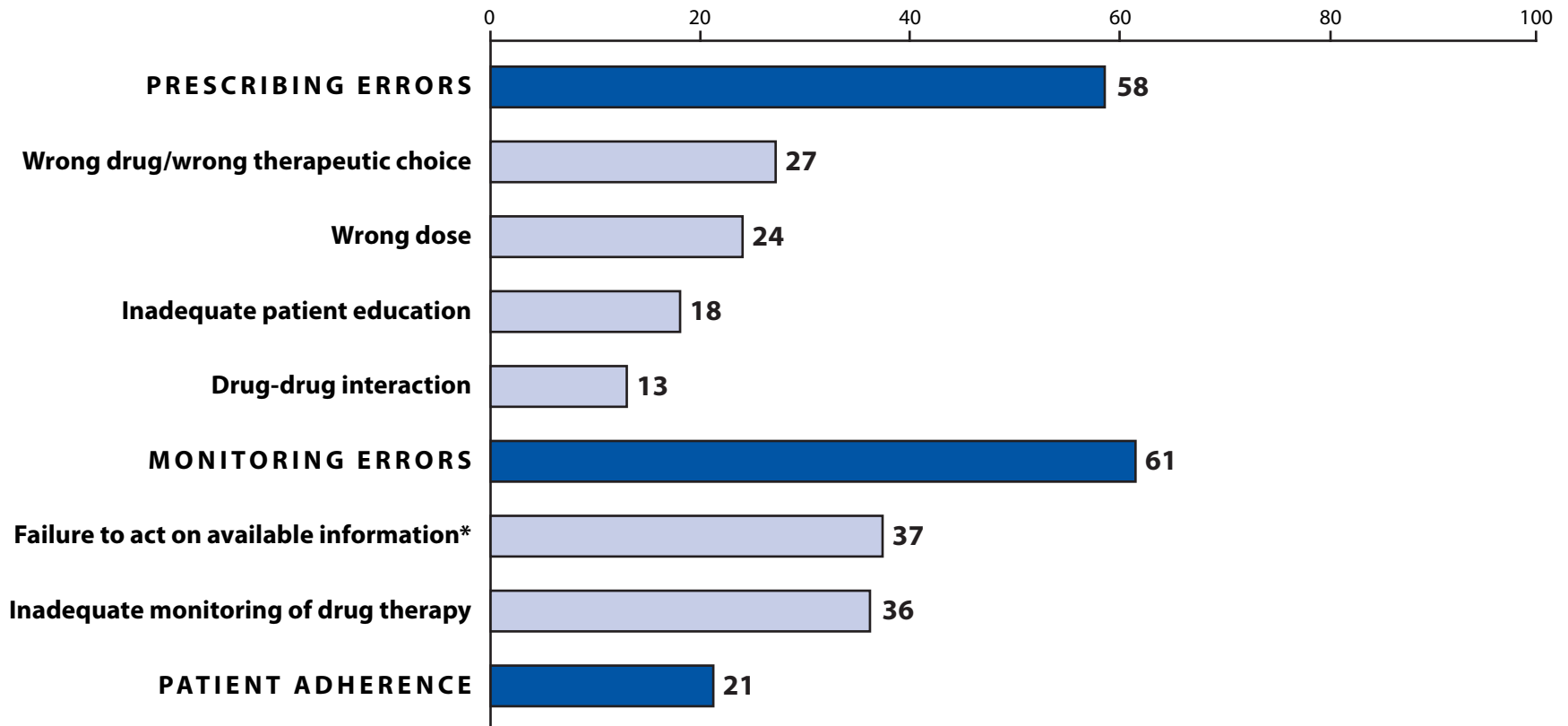
Implications: These findings, although limited, indicate that adverse drug events are a serious problem for seniors in the ambulatory setting. If these results are generalizable to the entire Medicare population, then the authors' calculations imply that about one-half million preventable adverse drug events occur annually among seniors in ambulatory care, of which 90,000 may be life-threatening. Routine automated monitoring of adverse drug events may become feasible as electronic health records come into widespread use.

The authors suggest that several interventions might reduce the occurrence of adverse drug events: computerized physician order entry with decision support, more systematic decision-making about prescribing and monitoring drugs with known potential for adverse events, closer collaboration between physicians and clinical pharmacists who are knowledgeable about drug interactions, and enhanced patient education and involvement to improve medication adherence (Gurwitz et al. 2003). Other research suggests that physicians can mitigate the consequences of adverse drug events by routinely asking patients about medication reactions (Weingart et al. 2005).

Preventable Adverse Drug Events in Ambulatory Care

A year-long study at a large, HMO-affiliated multispecialty group practice identified 1,523 adverse drug events (harm from medication) among 30,000 Medicare beneficiaries served during 1999–2000, of which 421 events were considered preventable because of medication errors of various kinds by health care providers or lack of patient adherence to prescriptions.

Types of medication errors that resulted in patient harm, as a percentage of all preventable adverse drug events among Medicare beneficiaries at a large physician practice



Source: Incident reports, hospital discharge summaries, medical records analyzed by Gurwitz et al. (2003).

Categories do not add because an adverse drug event may have been associated with multiple errors.

*Information relating to clinical findings or laboratory results.





SECTION 3

Access and Timeliness

Access and timeliness mean “obtaining needed care and minimizing unnecessary delays in getting that care.” – Institute of Medicine 2001b

ACCESS AND TIMELINESS • CHART 3:1

Unmet Need and Delay in Seeking Care

Why is this important? High-quality health care depends on timely access to needed services in an appropriate care setting. The Institute of Medicine has defined access to health care as “the timely use of personal health services to achieve the best possible health outcomes” (IOM 1993).

Findings: In 2002, elderly adults (ages 65 and older) were less likely than middle-age adults (ages 45–64) to report that they did not get needed medical care or that they delayed seeking care because of cost. Specifically, 2.5 percent to 3.6 percent of elderly adults versus 6.1 percent to 8.3 percent of middle-age adults reported unmet needs or delayed care-seeking (NCHS 2004b).

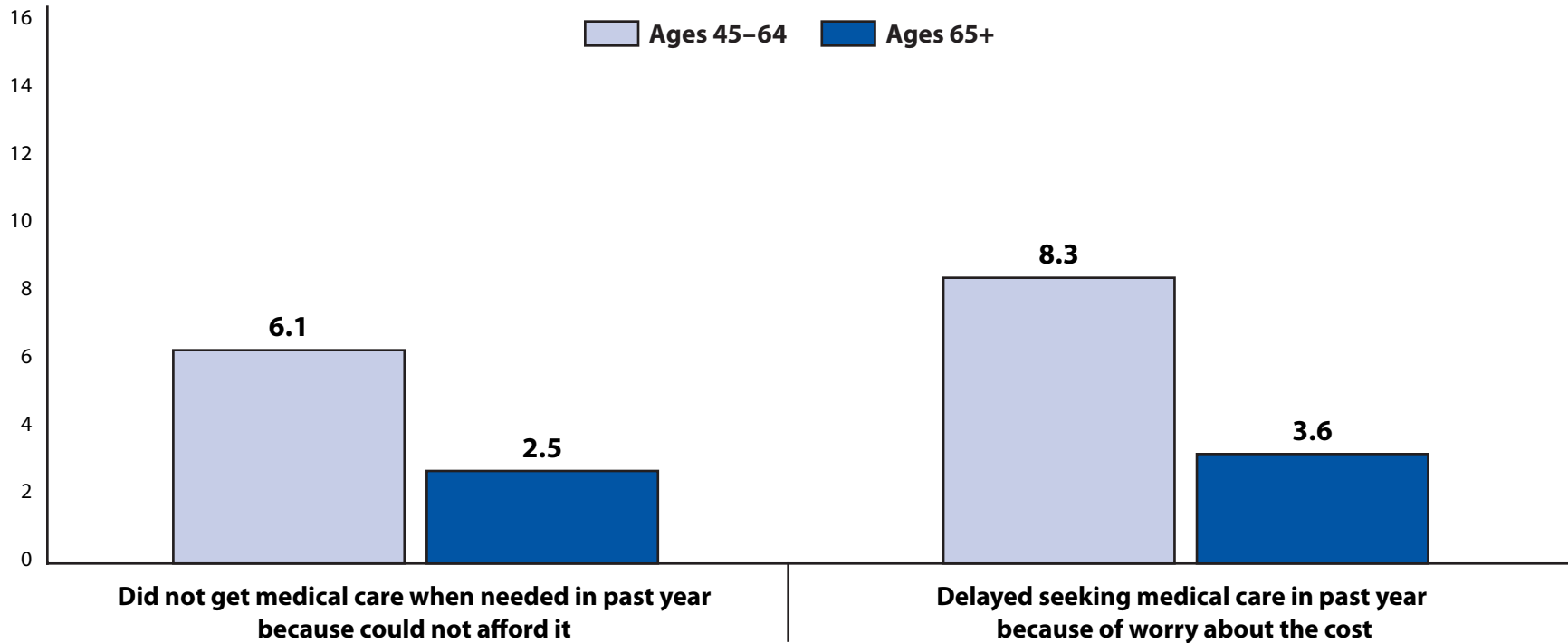
Implications: Individuals are more likely to have unmet health care needs if they are uninsured, lack a usual source of care, and have lower income (Shi and Stevens 2004). Medicare provides near-universal coverage for the elderly. In contrast, 13 percent of middle-age adults are uninsured (NCHS 2004b). The elderly are more likely than middle-age adults to have a usual source of care (see Chart 3:4). Access to care for the elderly appears to have improved since 1992, when 10 percent reported that they delayed seeking care because of cost (FIFARS 2004).

This survey question addressed general perceptions of unmet need for medical care. Asking about specific services and problems may elicit a fuller understanding of unmet needs (see Charts 3:2 and 4:1).

Unmet Need and Delay in Seeking Care

Elderly adults (ages 65 and older) are less likely than middle-age adults (ages 45–64) to have unmet medical care needs or to delay seeking care because of cost.

Percentage of community-dwelling adults who reported unmet needs or delays in care-seeking in 2002



Source: National Health Interview Survey (NCHS 2004b).



ACCESS AND TIMELINESS • CHART 3:2

Financial Barriers to Prescription Adherence

Why is this important? The Medicare Modernization Act of 2003 establishes outpatient prescription drug benefits for Medicare beneficiaries starting in 2006. Historically, beneficiaries have had to pay for prescription drugs out-of-pocket, or they relied on supplemental coverage to defray some of their out-of-pocket expenses. Sources of supplemental prescription drug coverage include employer-sponsored retiree health plans, Medicare managed care plans, and certain Medigap coverage; however, the depth of drug coverage provided by these programs varies considerably. Many states offer additional assistance to beneficiaries to help cover the gaps in coverage in the form of state-sponsored Medicaid and state pharmacy-assistance programs, especially for low-income seniors and those lacking supplemental coverage.

Findings: A survey conducted in 2001 of community-dwelling elderly Medicare beneficiaries (ages 65 and older) residing in eight states found that 14 percent of seniors decided not to fill a prescription because of cost, 16 percent skipped doses of medicine to make the prescription last longer, and 22 percent reported either type of cost-related nonadherence. Seniors without prescription drug coverage were twice as likely as those with drug coverage to report restricting prescriptions: 35 percent of those without prescription drug coverage, versus 18 percent of those with drug coverage, either did not fill a prescription or skipped doses because of cost (Kitchman et al. 2002; Safran et al. 2002).

Implications: Prescription drug coverage alone does not protect against high out-of-pocket spending for medications, nor does it sufficiently defray medication costs so that all seniors adhere to their prescription drug regimens. The situation is even direr for those without any prescription drug coverage at all.

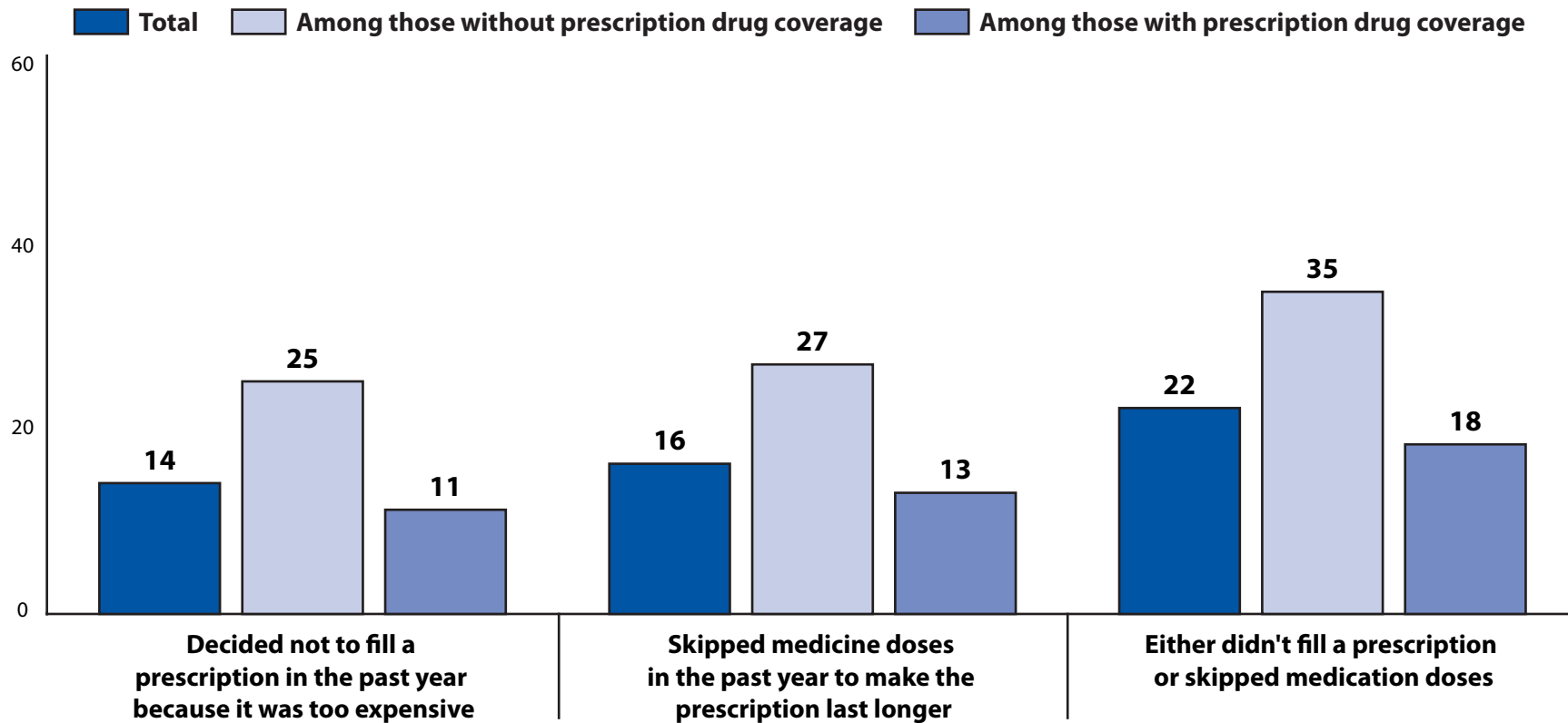
Seniors with chronic medical conditions must strictly adhere to their medication regimens for disease management. Yet this study found that one-quarter or more of seniors with congestive heart failure, diabetes, or hypertension who lacked prescription drug coverage did not fill at least one prescription in the previous year, and up to one-third skipped medication doses to make prescriptions last longer (Kitchman et al. 2002; Safran et al. 2002).

The national Medicare prescription drug discount cards were recently implemented to help ameliorate this access problem. Research such as this study will need to be repeated after the Medicare prescription drug benefit is implemented in 2006 to measure its effect on reducing prescription nonadherence.

Financial Barriers to Prescription Adherence

Lack of patient adherence to prescriptions can lead to adverse health outcomes. In a 2001 survey of elderly Medicare beneficiaries in eight states, those without prescription drug coverage were twice as likely as those with drug coverage to report that they had decided not to fill a prescription or that they had skipped medication doses for financial reasons.

Percentage of community-dwelling, elderly Medicare beneficiaries (ages 65+) in 8 states who reported restricting prescription drug use in 2001



Source: Kaiser Family Foundation / Commonwealth Fund / Tufts-New England Medical Center, Survey of Seniors (Kitchman et al. 2002; Safran et al. 2002).



ACCESS AND TIMELINESS • CHART 3:3

Financial Barriers to Access

Why is this important? The Medicare fee-for-service benefit package does not cover some important health care services (e.g., some preventive care; long-term care; dental, hearing, and vision services) and has high cost-sharing requirements, leaving coverage of these expenses up to the beneficiary. To fill in this expense gap, about 90 percent of beneficiaries obtain supplemental coverage such as an employer- or union-sponsored retiree benefit plan, an individually purchased Medigap plan, or Medicaid assistance. Alternatively, some beneficiaries join Medicare managed plans that typically provide broader benefits than fee-for-service Medicare (MedPAC 2002a).

Findings: An analysis of claims data from 1996 to 1999 for elderly Medicare fee-for-service beneficiaries (ages 65 and older) found that those without supplemental coverage were less likely than those with supplemental coverage to receive 11 of 17 measured services that an expert panel had deemed essential for high-quality care.* Services with the largest gaps included mammography every two years for females (27% vs. 62%) and assessment of visual impairment every two years for all elderly individuals (31% vs. 56%). Differences between those with supplemental coverage and those without a supplement were smaller for more highly used services, such as biannual physician visits for patients with congestive heart failure or diabetes (MedPAC 2002a).

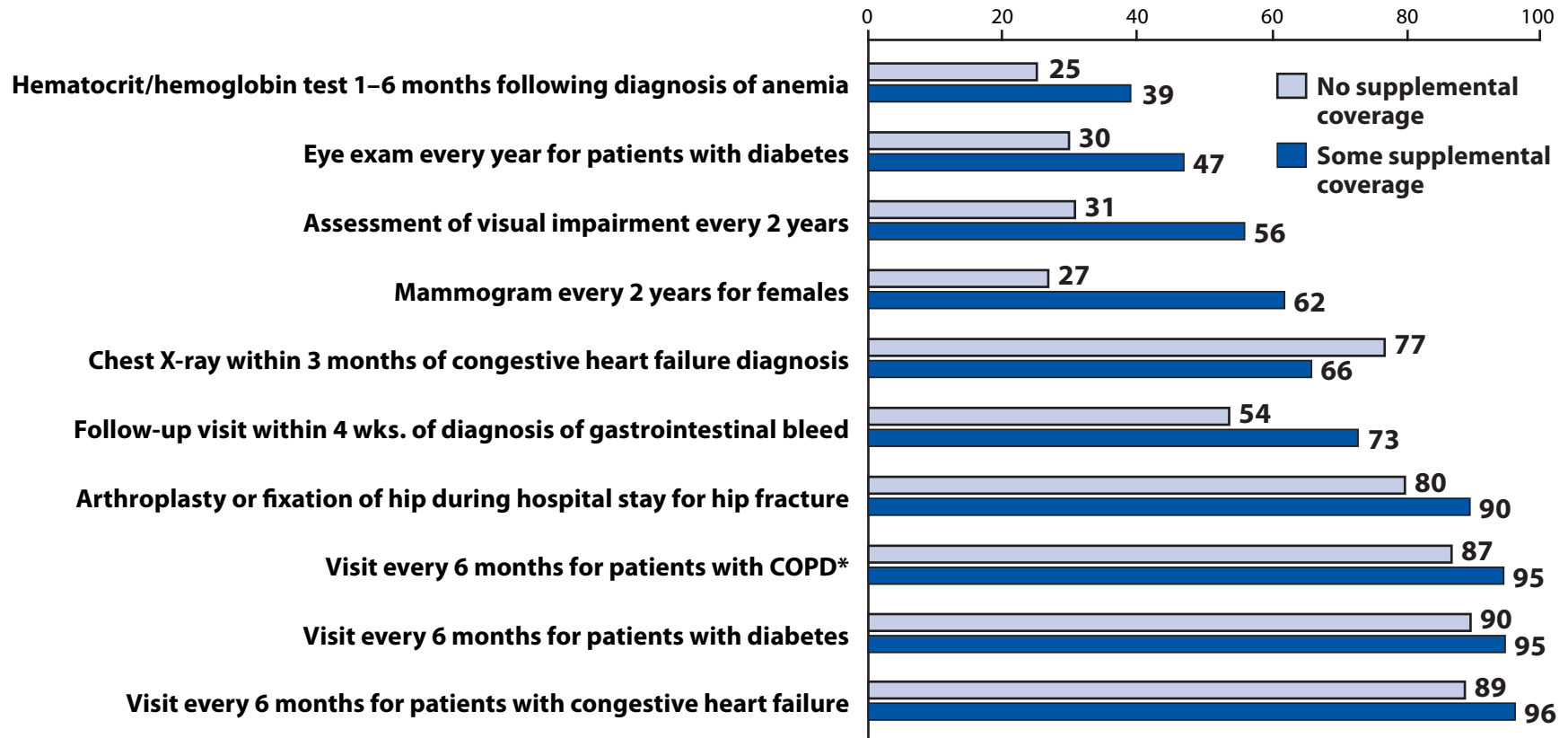
Implications: Supplemental Medicare coverage promotes access to and the use of necessary services, yet improvement is needed even for those with supplemental coverage, especially for preventive care. Recent trends suggest that gaining supplemental insurance coverage may be more difficult as employer-provided retiree coverage declines (Fronstin 2005). This implies that an increasing proportion of elders may be without access or unable to afford to pay for necessary services in the future (MedPAC 2002a). Identifying ways to improve access to needed medical care for all beneficiaries and creating a more efficient system for delivering high-quality care remain challenges for the Medicare program.

* Only services for which there was a difference are shown on the chart; annual physician visits are not shown. Managed care enrollees are not included.

Financial Barriers to Access

Elderly Medicare beneficiaries without supplemental insurance are less likely than those who have at least some supplemental coverage to use services that an expert panel ranked necessary for high-quality care.

Percentage of elderly Medicare fee-for-service beneficiaries ages 65+ who received selected services during 1996–1999



Source: RAND Access to Care for the Elderly Project indicators applied to Medicare Current Beneficiary Survey Cost and Use Files (MedPAC 2002a). Results shown are those for which there was significant difference in receipt by type of coverage, except that annual physician visit is not shown. *COPD = chronic obstructive pulmonary disease.



ACCESS AND TIMELINESS • CHART 3:4

No Usual Source of Health Care

Why is this important? The most important benefit of insurance is to facilitate having a regular source of care (Starfield 1998). Whether an individual has a regular place to go for health care—such as a physician’s office or clinic—is an even more powerful predictor of receiving preventive care than whether he or she has health insurance coverage (Breen et al. 2001). Among elderly Medicare beneficiaries surveyed in 1998, for example, 65 percent of those with a usual source of care received a mammogram versus only 23 percent of those without a usual source of care.

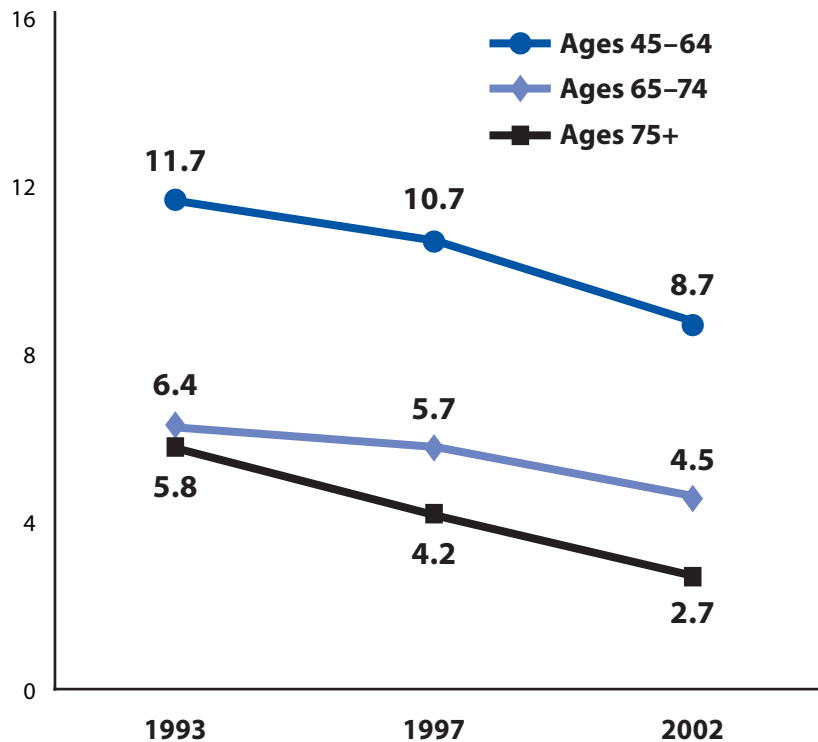
Findings: The elderly are more likely than middle-age adults to have a usual source of care. In 2002, only 4.5 percent of those ages 65 to 74 and 2.7 percent of those ages 75 and older had no usual source of care; by comparison, 8.7 percent of those ages 45 to 64 had no usual source of care. The proportion without a usual source of care declined by 2 to 3 percentage points from 1993 to 2002 among both elderly and middle-age adults. Among the elderly, the proportion without a usual source of care declined by 8 percentage points among those with Medicare coverage only, from 12 percent in 1993 to 4.2 percent in 2002. As a result, the disparity by type of coverage was greatly reduced (NCHS 1997a, 1997b, 2002, 2004c).

Implications: These findings do not describe whether patients have established a personal and continuing relationship with a particular physician or clinician at their usual place of care. Nevertheless, the improvements seen here were likely to have had positive effects on the provision of preventive care and potentially other important services as well.

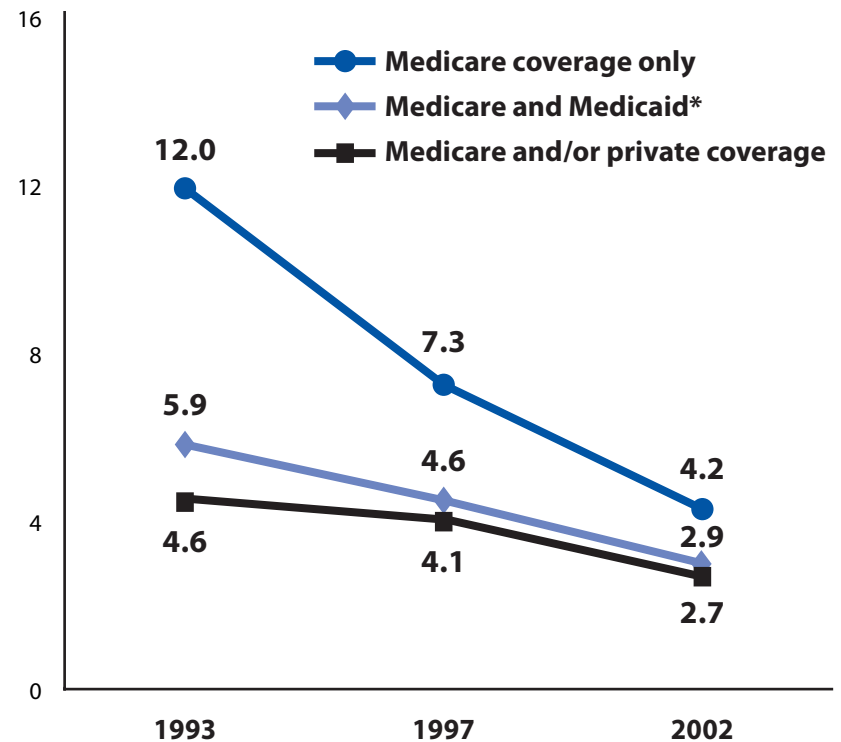
No Usual Source of Health Care

Adults with a usual source of health care are more likely to get recommended preventive care, such as cancer screening, than those without a usual source of care. The elderly are more likely than middle-age adults to have a usual source of care. Between 1993 and 2002, the proportion without a usual source of care declined for both middle-age and elderly age groups. This improvement was especially pronounced among elderly Medicare beneficiaries with Medicare coverage only.

Percentage of community-dwelling adults without a usual source of health care, by age group



Percentage of community-dwelling elderly adults (ages 65+) without a usual source of care, by type of coverage



Source: National Health Interview Survey (NCHS 1997a, 1997b, 2002, 2004c). *For 1993, Medicare and Medicaid category includes those with other state-sponsored health plans, including medical assistance programs. Other coverage and uninsured categories are omitted from type of coverage.



ACCESS AND TIMELINESS • CHART 3:5

Waiting Time for Physician Visits for a Specific Illness

Why is this important? The Medicare physician payment rate reduction of 5.4 percent in 2002 and additional annual rate reductions on the horizon have raised concern that access to needed health care for the elderly will decline if a growing proportion of physicians are unwilling to serve new Medicare beneficiaries. From 1997 to 2001, the proportion of physicians who were willing to accept all new Medicare patients into their practice decreased from 75 percent to 71 percent (Trude and Ginsburg 2005).

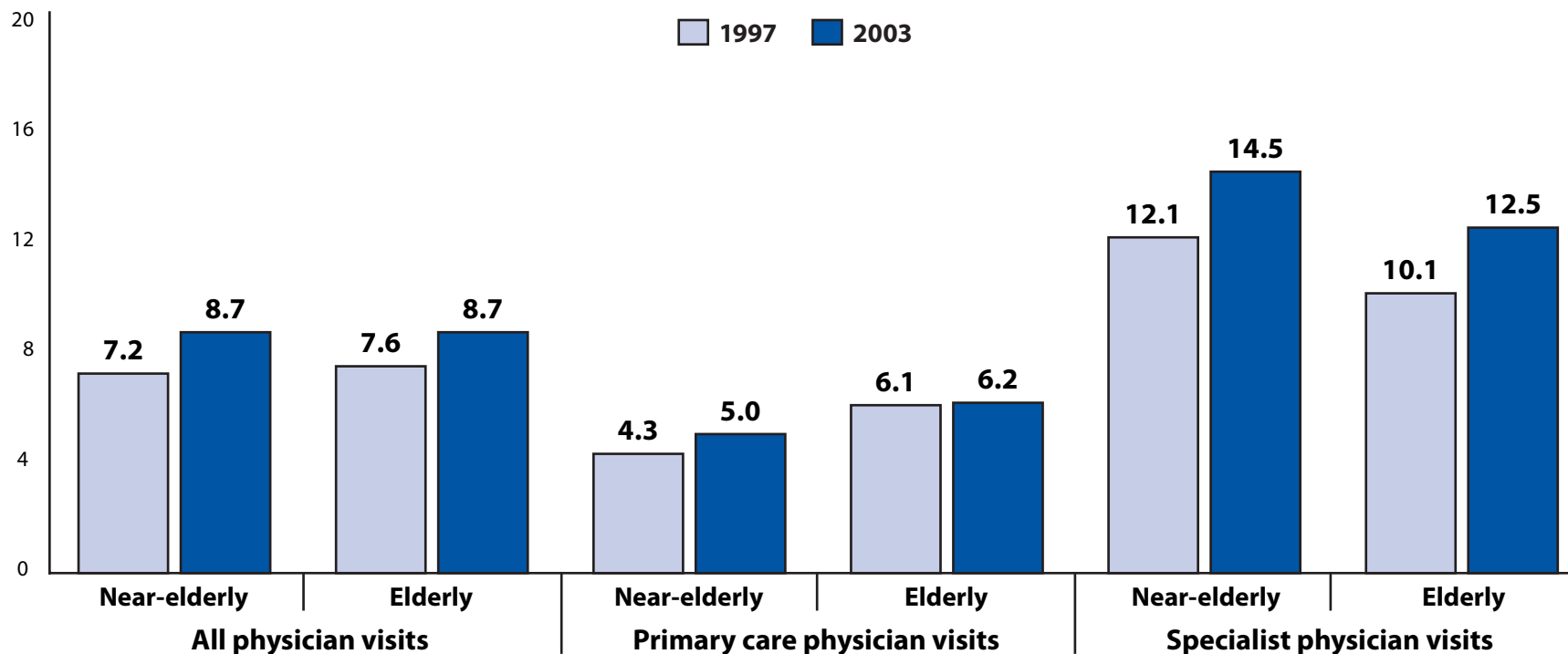
Findings: In a nationally representative survey, both elderly patients (ages 65 and older) and near-elderly patients (ages 55 to 64) waited almost nine days on average in 2003 to see a physician for a specific illness. Waits were longer to see a specialist than to see a primary care doctor. Compared to the near-elderly, the elderly waited one day longer to see a primary care physician (6.2 days vs. 5 days), but they waited two days fewer to see specialty physicians (12.5 days vs. 14.5 days). Both groups waited longer in 2003 than they did in 1997; this overall increase was attributable mainly to increases of more than two days in waiting times to see specialist physicians (Trude and Ginsburg 2005).

Implications: The parallel trends in waiting time increases for both elderly and near-elderly patients suggest “that health system developments were much more important influences on beneficiary access than any effects of Medicare’s 2002 physician payment rate reduction” (Trude and Ginsburg 2005). Whether these increases in waiting times correlate with any changes in the clinical quality of health care for patients is not known. The authors noted that although waiting times have increased, patient complaints about delayed care did not increase proportionally. “Presumably, patients now expect longer waits for appointments and no longer consider these longer waits as delaying care,” the authors write (Trude and Ginsburg 2005). This kind of data deserves continued monitoring to determine whether these trends continue and what effect they may have on patient experience and clinical quality of care.

Waiting Time for Physician Visits for a Specific Illness

From 1997 to 2003, the average waiting time to see a physician for a specific illness increased for both elderly adults (ages 65 and older) and near-elderly adults (ages 55 to 64), primarily because of an increase in time to see specialists. In 2003, elderly and near-elderly adults waited the same amount of time overall. The elderly waited about one day longer than near-elderly adults to see a primary care physician, but near-elderly adults waited two days longer than elderly adults to see a specialist.

Average waiting times (in days) for appointments to see a physician for a specific illness among community-dwelling adults



Source: Center for Studying Health System Change, Community Tracking Study (Trude and Ginsburg 2005).



ACCESS AND TIMELINESS • CARE AT END OF LIFE • CHART 3:6

Use of Hospice at End of Life

Why is this important? Hospice is a patient- and family-centered concept of health care for the terminally ill that aims to maintain the comfort of the dying person, rather than seek a cure for the illness. Hospice is not a place but an approach to care that frequently allows the terminally ill to be cared for at home, where most people say they would prefer to die (Tang 2003). A multidisciplinary hospice care team provides home visits, on-call professional health care, teaching and emotional support for the family, pain management, and spiritual care for the patient. Since 1983, Medicare has covered hospice care for beneficiaries whose doctors certify that they have a life expectancy of six months or less. Understanding trends in hospice care will become more important with the growing elderly population (MedPAC 2004b).

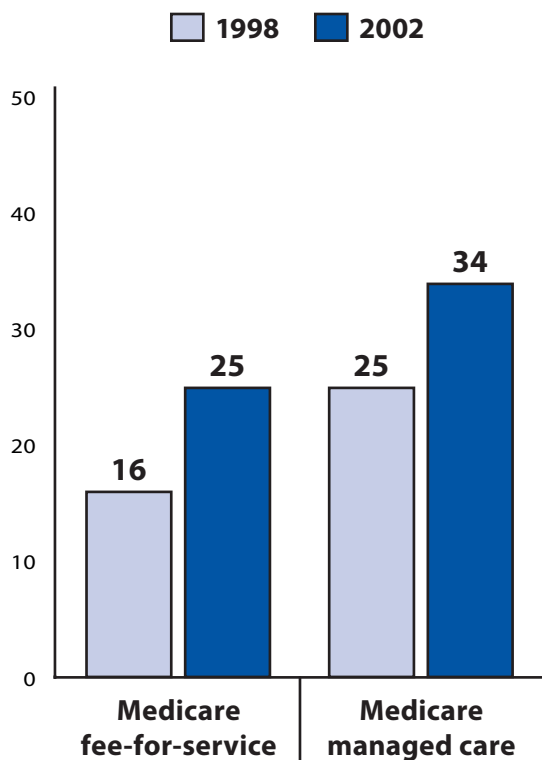
Findings: Hospice use among Medicare beneficiaries increased by 9 percentage points from 1998 to 2002. The increase was greatest among the oldest. Those in managed care plans were more likely to use hospice services at the end of life than those in traditional, fee-for-service Medicare. Among Medicare fee-for-service beneficiaries in 1998, hospice use declined with increasing age, but by 2002, hospice use was similar across all age groups (MedPAC 2004b).

Implications: Increasing use of hospice among Medicare beneficiaries may reflect better understanding of the goals of hospice. Hospice is used by about 60 percent of those who die of cancer, but hospice use increased the most among those with other life-threatening chronic illnesses such as heart disease and Parkinson's disease (MedPAC 2002c). The Medicare Modernization Act of 2003 includes provisions that may increase the use of hospice, including coverage for a one-time consultation session to evaluate a patient's eligibility and need for hospice care (HCFO 2004).

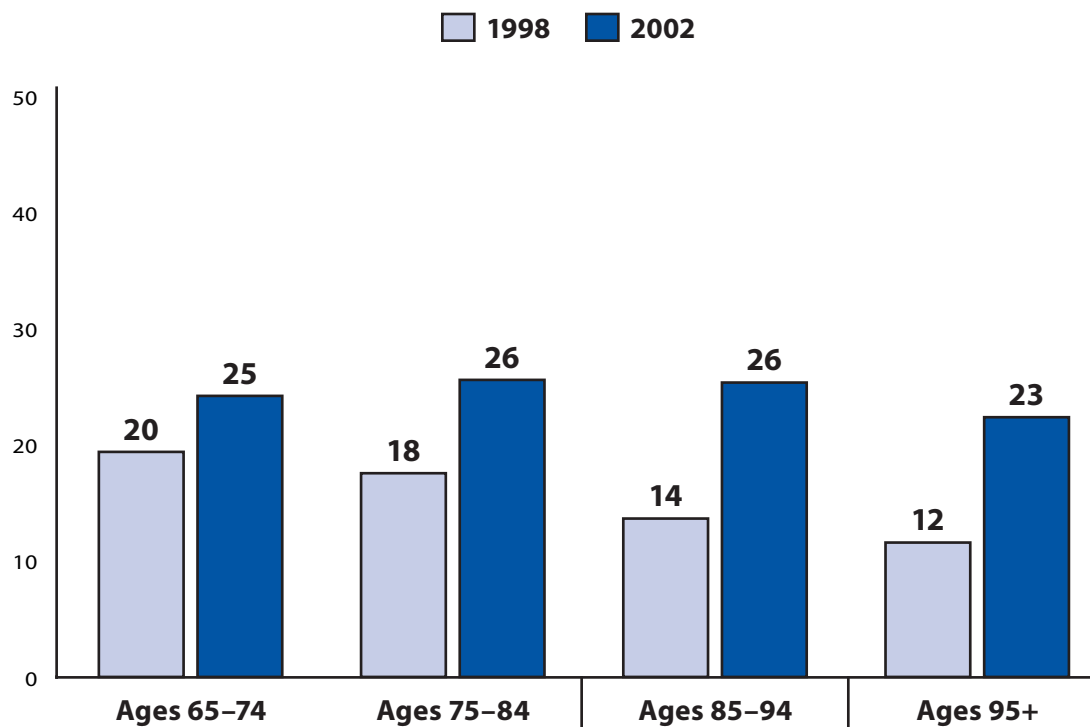
Use of Hospice at End of Life

Hospice use increased among Medicare beneficiaries from 1998 to 2002 but especially among the oldest beneficiaries. Those in managed care plans were more likely to use hospice services at the end of life than those in traditional Medicare.

Percentage of all Medicare beneficiaries who used hospice at end of life (all ages)



Percentage of elderly Medicare fee-for-service beneficiaries who used hospice at end of life (ages 65+)



Source: Medicare Payment Advisory Commission (2004b) analysis of Medicare administrative data.





SECTION 4

Patient and Family Centeredness

Patient and family centeredness refers to “health care that establishes a partnership among practitioners, patients, and their families (when appropriate) 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. — Institute of Medicine 2001b

PATIENT AND FAMILY CENTEREDNESS • CHART 4:1

Experiences with Insurance and Care

Why is this important? Medicare is the United States' only national social health insurance program, covering 41 million Americans including 35 million elderly. When the Medicare program was created in 1965, its structure was modeled on the dominant approach to private insurance and fee-for-service health care at that time. Approaches to health care delivery and private insurance have since diversified, raising questions about whether Medicare offers good value and has adequately evolved to be effective in service delivery and responsive to public expectations.

Findings: In a national survey of adults ages 19 and older conducted in 2001, elderly Medicare beneficiaries (ages 65 and older) were more likely than privately insured nonelderly adults (ages 19 to 64) to rate their health insurance coverage as very good or excellent and to report that they were very satisfied with the care they received. In contrast, privately insured nonelderly adults were more likely to report coverage problems with their insurance and that they did not seek or receive medical care in the past year because of costs (Davis et al. 2002).

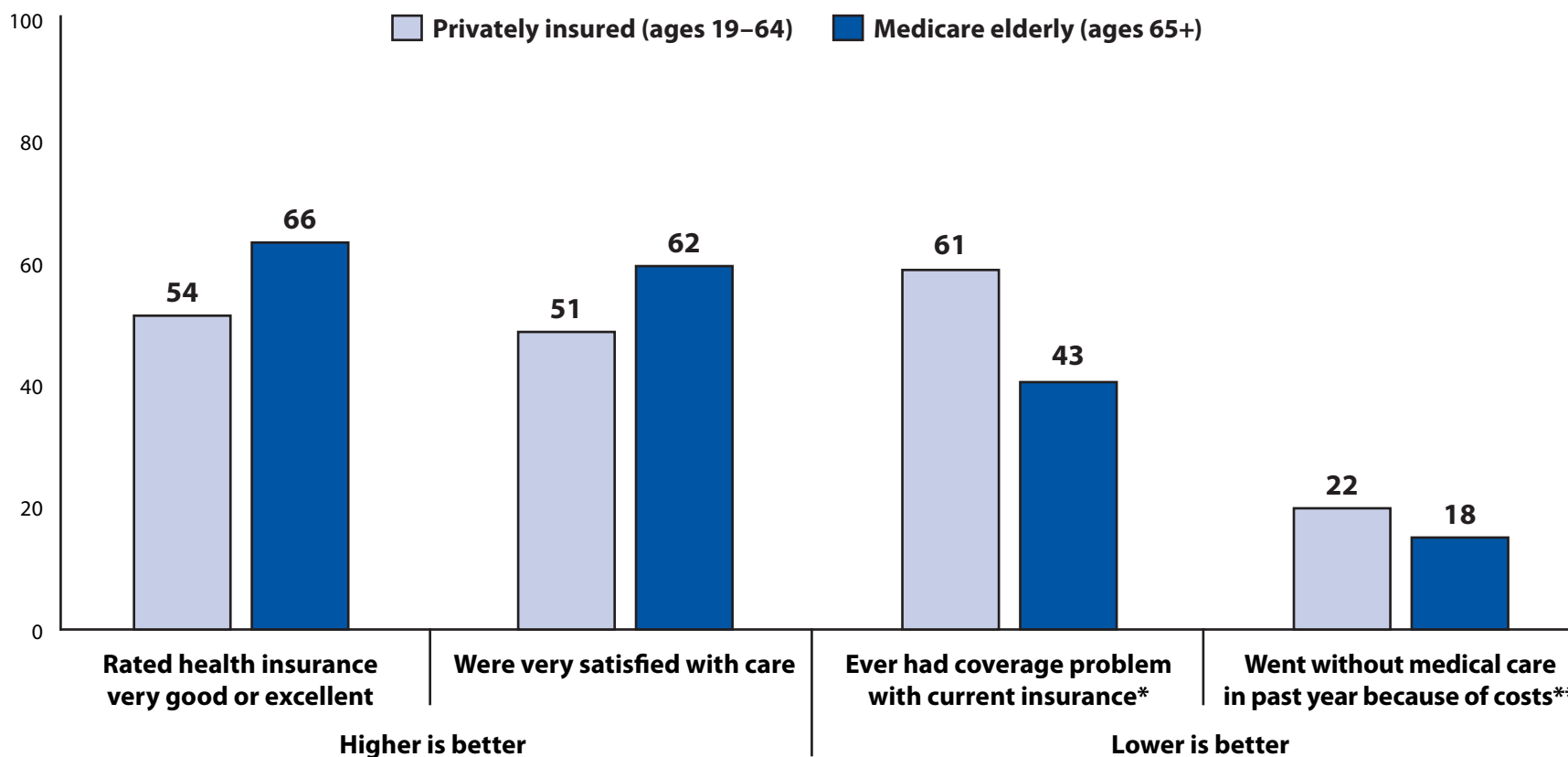
Implications: These results reflect elderly Medicare beneficiaries' overall experiences with insurance and health care, including coverage provided by the Medicare program and any supplemental insurance they may have had. Whatever the relative contribution, the combination appeared to result in a more positive experience for Medicare beneficiaries than that reported by privately insured nonelderly adults. The elderly had more positive experiences despite their higher prevalence of poor health and low income compared to the privately insured nonelderly.

The study authors speculated that differences in perceptions might relate to factors such as plan administration, choices, and benefit structures under Medicare and private insurance (Davis et al. 2002). Understanding what aspects of the Medicare program are working well for beneficiaries is important to preserving the best of Medicare for the future.

Experiences with Insurance and Care

Compared to privately insured nonelderly adults, elderly Medicare beneficiaries were more likely to rate their insurance highly and to be satisfied with their care, and were less likely to report problems with coverage and access to care. Elderly respondents' ratings of insurance reflect their experiences with the Medicare program and any supplemental coverage.

Percentage of community-dwelling adult respondents who reported positive or negative experiences, 2001



Source: Commonwealth Fund 2001 Survey of Health Insurance (Davis et al. 2002). *Any of the following responses: plan did not pay anything for care that respondent thought was covered; plan covered only a part of service; reached limit on what plan paid for specific illness or injury. **Any of the following responses: did not fill prescription; did not get needed specialist care; skipped recommended test or follow-up; had a medical problem but did not visit doctor or clinic.



ACCESS AND TIMELINESS / PATIENT AND FAMILY CENTEREDNESS • CHART 4:2

Consumer Assessment of Health Plans

Why is this important? “Since many older Americans suffer from one or more chronic health problems, it is especially important for them to understand their health care options and make informed choices about health insurance coverage” (AHRQ 2002c). When selecting among health care coverage arrangements, consumers are often most interested in learning about the experiences that other people like themselves have had with these options (KFF/AHRQ 1996). In response, the federal government sponsored development of the Consumer Assessment Health Plans Study (CAHPS) survey “to help consumers identify the best health care plans and services for their needs” (AHRQ 1998). The federal Centers for Medicare and Medicaid Services uses CAHPS to report comparative information on the experiences of beneficiaries in the original Medicare fee-for-service program and Medicare managed care plans, at both the national and local levels.

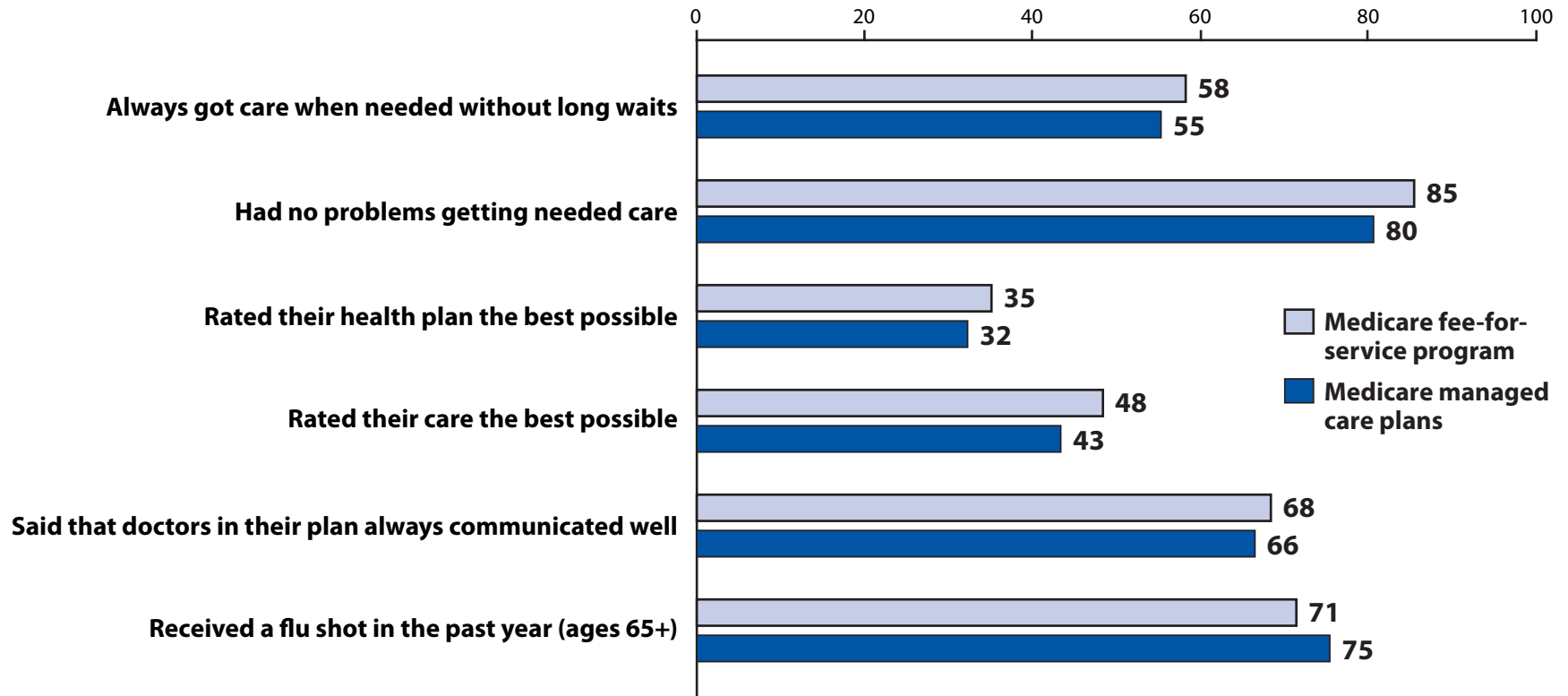
Findings: As of 2003, Medicare fee-for-service beneficiaries were somewhat more likely than those in managed care plans to give high ratings to their plan, doctor, and care. In contrast, Medicare managed care plan members were somewhat more likely to report that they had received a recent flu shot. Differences between average ratings for Medicare fee-for-service and for Medicare managed care were small, ranging from 2 to 5 percentage points among six publicly reported CAHPS measures (CMS 2005c).

Implications: The comparative data shown in the chart are consistent with the findings of prior studies. For example, an analysis of 2000 and 2001 CAHPS data found that elderly fee-for-service Medicare beneficiaries “generally rated their care and physicians higher and reported fewer problems obtaining needed care than did [Medicare managed care] enrollees. In contrast [Medicare managed care] enrollees reported receiving recommended preventive services...more frequently and reported fewer problems related to paperwork and information” (Landon et al. 2004). The same study found that results varied geographically and that variation among competing managed care plans was as great as the overall difference between managed care plans and fee-for-service Medicare. This means that it is important for Medicare beneficiaries to examine the performance of particular Medicare health plans available in their local market.

Consumer Assessment of Health Plans

Medicare fee-for-service beneficiaries were somewhat more likely than those in managed care plans to give high ratings to their plan, doctor, and care in 2003. In contrast, Medicare managed care plan members were somewhat more likely to report that they had received a flu shot.

Percentage of Medicare beneficiaries surveyed who reported positive plan experiences, 2003



Source: Center for Medicare and Medicaid Services, Medicare Health Plan Compare Web site, Consumer Assessment of Health Plans Survey (CMS 2005c). Rates are case-mix adjusted to control for differences in respondents' age, education, and self-reported health status, and in whether respondents had assistance answering the survey.



PATIENT AND FAMILY CENTEREDNESS • CHART 4:3

Interpersonal Quality of Care

Why is this important? The quality of communication between patients and their health professionals may affect patients' receptivity to receiving advice, their adherence to treatment regimens, and their satisfaction with and outcomes of care (Stewart 1995; Stewart et al. 2000). The amount of time that patients spend with clinicians may affect their ability to fully explain their personal needs and to raise questions about their diagnosis and treatment.

Findings: Among seniors who visited a doctor's office during 2001, two-thirds reported that the doctor or other health professional always listened carefully and showed respect. More than half reported that health professionals always explained things carefully and spent enough time with them. Seniors gave somewhat better ratings than middle-age adults on three of four measures of interpersonal aspects of care (AHRQ 2005b).

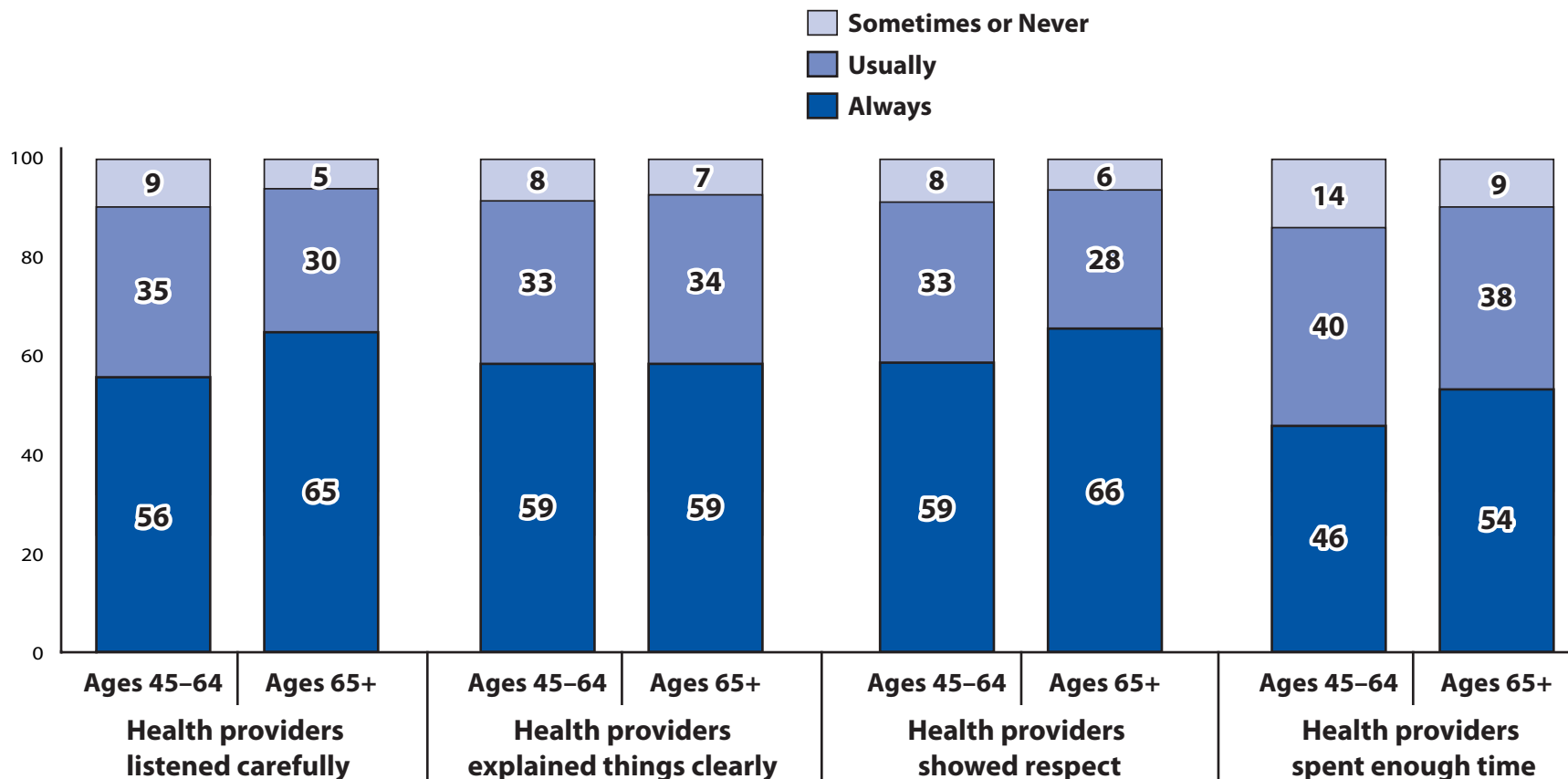
Implications: The fact that seniors gave higher ratings to interpersonal quality of care is encouraging given that they often have more complex needs than younger adults. Interpersonal deficits in care might account for some of the perception of inadequate time spent with the physician (Gross et al. 1998). Several types of interventions directed at both physicians and patients might be effective in improving physician-patient interactions and patient outcomes, such as:

- education and incentives for health professionals and their staff to help improve patient-centered communication skills (Lewin et al. 2001);
- culturally relevant questionnaires, written and audiovisual materials, and coaching or skills training to help prepare patients (and their family members) for effective health care encounters (Cegala et al. 2001; Post et al. 2002);
- interpreter services and teams of professionals that include at least one bilingual professional to overcome language barriers (Brach and Fraser 2000);
- use of mid-level practitioners (physician assistants and nurse practitioners) to increase time spent with patients during intake and follow-up care (Berry et al. 2003); and
- follow-up services such as telephone calls to determine how the patient is doing post-care (Car and Sheikh 2003).

Interpersonal Quality of Care

About two-thirds of seniors reported that their health professionals always listened carefully and showed respect and more than one-half reported that health professionals always explained things well and spent enough time with them. Seniors gave somewhat better ratings than middle-age adults on three of these four measures of interpersonal aspects of care.

Percentage distribution of ratings in 2001 by community-dwelling adults who visited a doctor's office in the past year



Source: Medical Expenditure Panel Survey (AHRQ 2005b). Numbers may not add to 100 because of rounding.



PATIENT AND FAMILY CENTEREDNESS • CHART 4:4

Beneficiary Knowledge of Medicare and Accuracy of Medicare Information

Why is this important? The Balanced Budget Act of 1997 required that the federal Centers for Medicare and Medicaid Services (CMS) provide Medicare beneficiaries with educational materials to help them understand the Medicare program and their coverage options. In response, CMS designed a National Medicare Education Program that uses multiple communication channels including printed materials, a toll-free telephone information line, Internet sites, and training and support for information intermediaries such as state health insurance assistance programs. A reference handbook called *Medicare & You* was mailed to all Medicare beneficiary households in 1999 (following a five-state pilot conducted in 1998) and continues to be mailed to all newly enrolled beneficiaries monthly (Goldstein 2001).

Findings: The proportion of elderly Medicare beneficiaries who have all the information about Medicare they say they need has increased since Medicare enhanced its educational efforts, from 35 percent in 1998 to 46 percent in 2002. Likewise, the proportion who say they have little or none of what they needed to know declined from 36 percent in 1998 to 24 percent in 2002. Minority beneficiaries and those with lower incomes and less education were less likely to report that they knew all or most of the Medicare information they needed (data not shown) (CMS 2000a, 2004a).

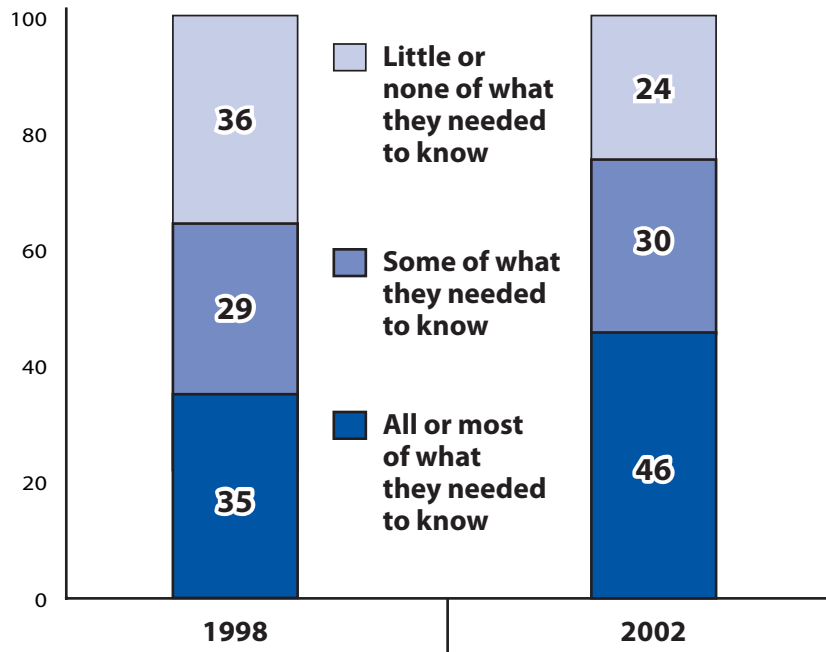
A separate audit conducted by the Government Accountability Office in 2004 found that only six of every 10 calls to the 1-800-MEDICARE beneficiary help line were answered accurately. The auditors concluded that customer service representatives “provided inaccurate information largely because they did not always understand enough about the Medicare program to access a script that answered the question or could not clearly explain the material in the script that they were using” (GAO 2004a).

Implications: Although beneficiary education improved between 1998 and 2002, less than half of Medicare beneficiaries felt that they had all the information they needed. CMS reports that it is intensifying its educational efforts to prepare beneficiaries for changes brought about by the Medicare Modernization Act of 2003. The agency hired more customer service representatives and conducted additional training to improve call accuracy and active listening. It is partnering with Medicare consumer organizations and nonprofit community organizations that provide advice and counseling, focusing especially on low-income beneficiaries and their caregivers. A Regional Education About Choices in Health (REACH) campaign is providing culturally and linguistically appropriate information to those who may not receive information through traditional media channels (CMS 2005e).

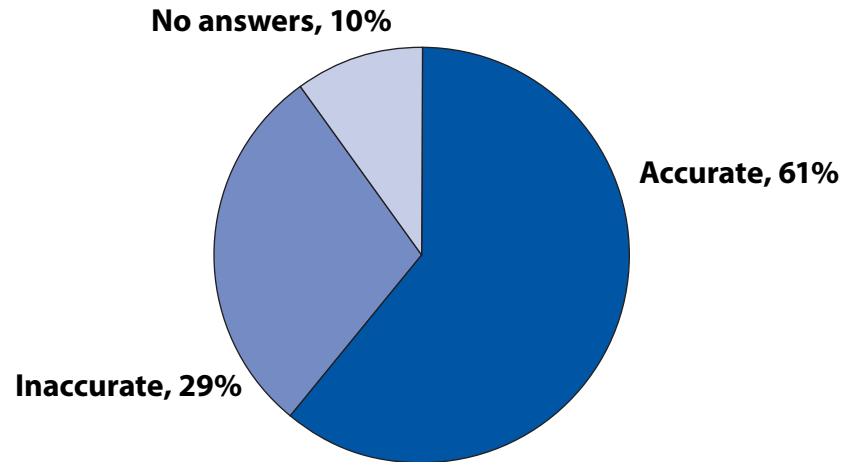
Beneficiary Knowledge of Medicare and Accuracy of Medicare Information

The proportion of elderly Medicare beneficiaries who have the information about Medicare they say they need has increased somewhat since Medicare enhanced its educational efforts, although more than one-half do not yet have the information they need. Only six of every 10 calls to the Medicare information line were answered accurately in a 2004 government audit.

Percentage distribution of how much elderly Medicare beneficiaries (ages 65+) said they knew about the Medicare program*



Percentage of 420 calls to the Medicare toll-free information line that were answered accurately, according to a 2004 government audit



Sources: Authors' calculations using Medicare Current Beneficiary Survey, Access to Care File results published by the Centers for Medicare and Medicaid Services (CMS 2000a, 2004a); Government Accountability Office audit (GAO 2004a). *Responses represent all community-dwelling (noninstitutionalized) Medicare beneficiaries.



PATIENT AND FAMILY CENTEREDNESS • CARE AT END OF LIFE • CHARTS 4:5 TO 4:7

Quality of Care at End of Life

Why is this important? As medical care has changed over the last century, deaths today are more likely to occur in health care institutions than in individuals' homes. In response to concerns about the quality of care at the end of life, a 1997 Institute of Medicine report recommended that health care stakeholders should collaborate to strengthen methods for measuring the quality of care for dying patients and their families (IOM 1997). A synthesis of research suggests that patient- and family-centered end-of-life care involves providing dying individuals with desired physical comfort and emotional support, supporting shared decision-making, treating the dying person with respect, providing emotional support to family members, and coordinating care across settings (Teno et al. 2001).

Findings: In a nationally representative study, 15 percent to 50 percent of family members expressed concerns about some aspects of the care delivered at the end of life to a relative who died in 2000 from chronic illness (average age 74). Inadequate emotional support for the patient and family were the most often-cited concerns across all settings and types of care. Family members of patients who died at home with hospice care were less likely to report concerns than were family members of patients who died with other care arrangements or in other settings. Moreover, family members of patients who died

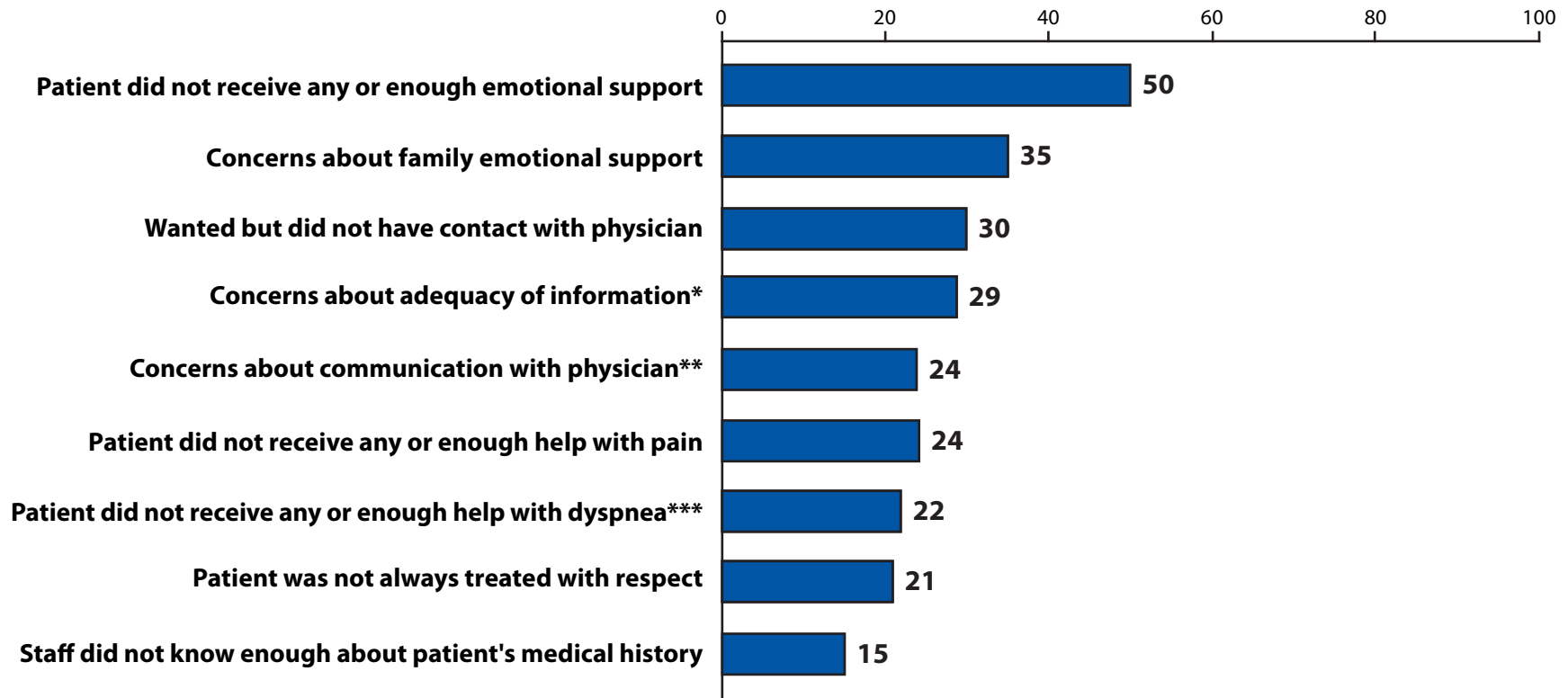
at home with hospice care were more likely to rate the overall quality of care as excellent (71% vs. 42% to 47%; not shown) (Teno et al. 2004).

Implications: Family perceptions of the quality of end-of-life care raise concerns about how well the health care system is meeting expectations of patients and their families for “death with dignity.” Measuring these facets of end-of-life care on an ongoing basis at the national and individual provider levels would help to identify and monitor progress at efforts for improvement. Data are needed to determine whether and how these types of perceptions might vary among racial and ethnic groups. The study authors concluded that these “results call for a public health approach that uses sustained and multifaceted interventions to improve end-of-life care in the United States” (Teno et al. 2004). Increasing access to hospice care and other palliative care programs at end of life are two possible approaches (see Charts 3:6 and 6:8).

Quality of Care at End of Life: Part I

Up to one-half of family members expressed concerns about some aspects of the care delivered to a deceased relative at the end of life. The issue eliciting the greatest concern was emotional support for the patient and family.

Percentage of family respondents expressing concern about quality of care at the last place of care for adults who died of a chronic illness in 2000



Nationally representative mortality follow-back telephone survey (N = 1,380 decedents who used health care services at end of life; average age 74) (Teno et al. 2004). Last place of care is the place where the decedent spent more than 48 hours prior to death. *Information regarding what to expect while patient was dying. **Among those who had contact with a physician. ***Dyspnea is difficulty breathing.



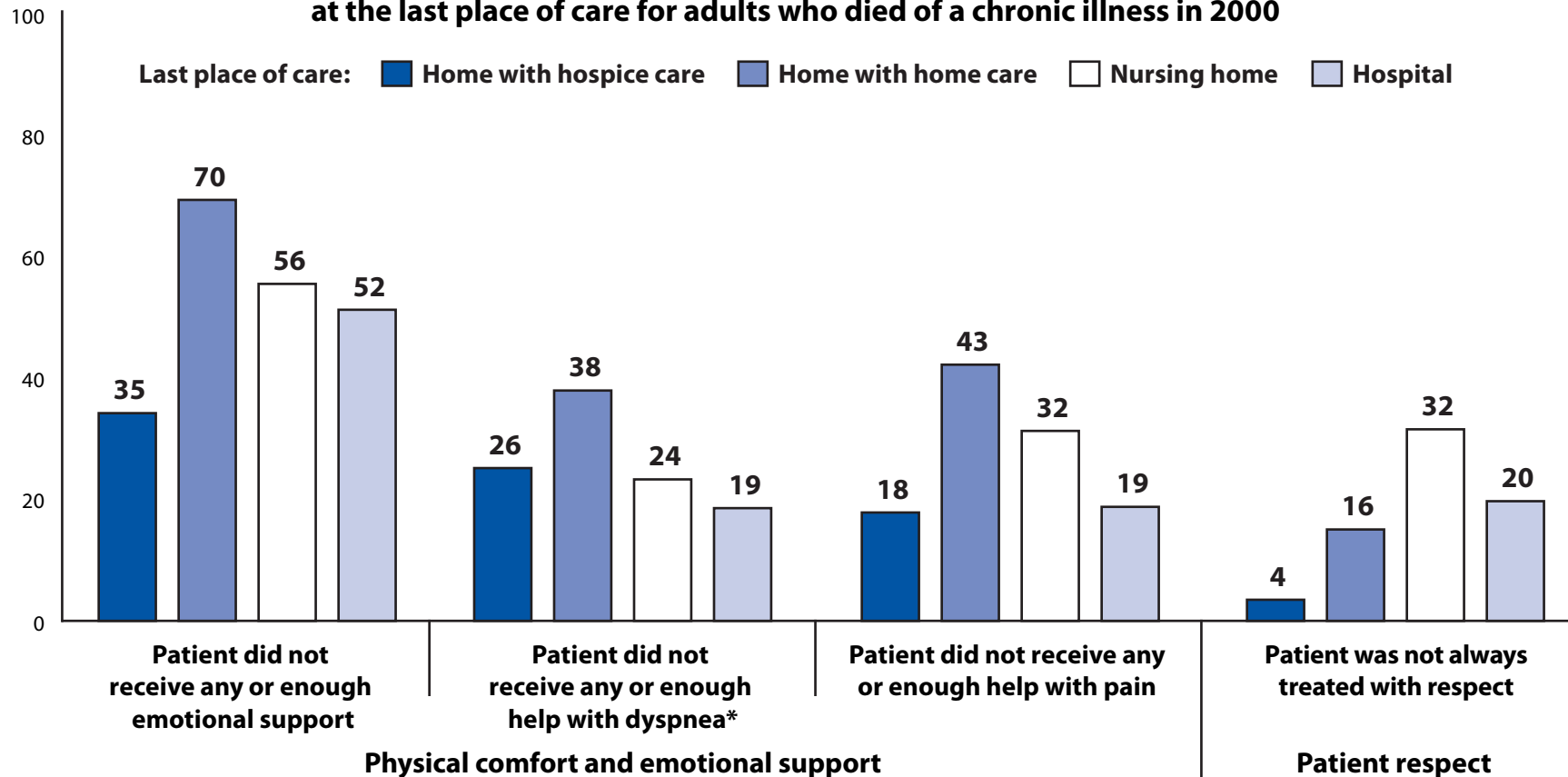
PATIENT AND FAMILY CENTEREDNESS • CARE AT END OF LIFE • CHART 4:6

Quality of Care at End of Life: Part II



Family members generally had fewest concerns for patients who died at home with hospice care.

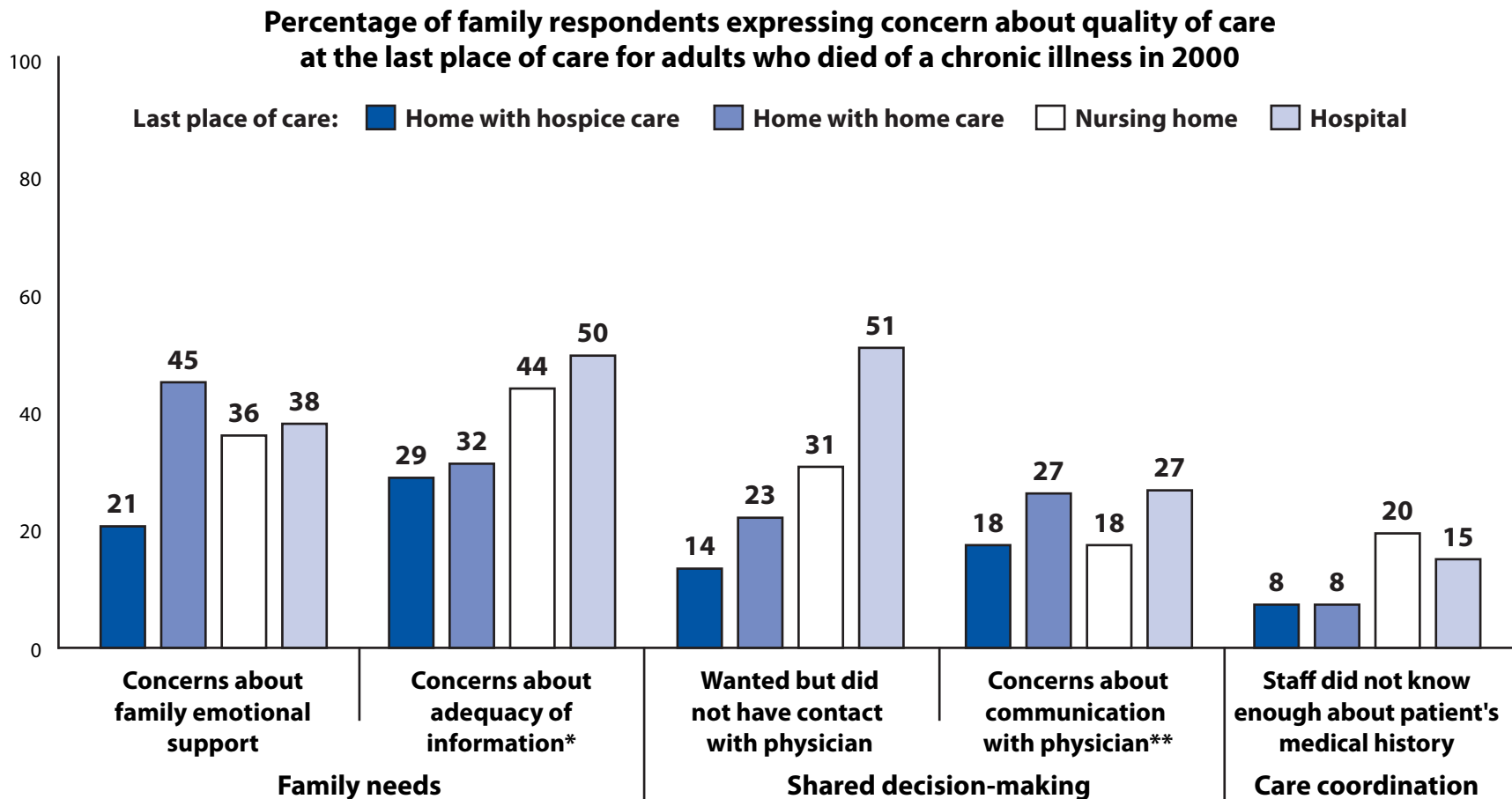
Percentage of family respondents expressing concern about quality of care at the last place of care for adults who died of a chronic illness in 2000



Nationally representative mortality follow-back telephone survey (N = 1,380 decedents who used health care services at end of life; average age 74) (Teno et al. 2004). Last place of care is the place where the decedent spent more than 48 hours prior to death. *Dyspnea is difficulty breathing.

Family Ratings of Quality of Care at End of Life: Part III

Family members generally had fewest concerns for patients who died at home with hospice care.



Nationally representative mortality follow-back telephone survey (N = 1,380 decedents who used health care services at end of life; average age 74) (Teno et al. 2004). Last place of care is the place where the decedent spent more than 48 hours prior to death.

*Information about what to expect while patient was dying. **Among those who had contact with a physician.





SECTION 5

Equity

Equity means “providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.” — Institute of Medicine 2001a

EQUITY • PATIENT SAFETY • CHART 5:1

Racial and Ethnic Disparities in Adverse Events and Complications of Care

Why is this important? A substantial body of research has documented that racial and ethnic minority Americans are worse off than white Americans on a wide variety of indicators of health care access and quality that determine health outcomes (IOM 2003). Understanding the incidence and nature of adverse events in different racial and ethnic groups might encourage health care organizations to investigate their own performance and develop strategies for improvement. This chart focuses on three adverse events or complications of care in the hospital (as measured using Patient Safety Indicators applied to hospital billing records) that can often be prevented with good medical and nursing care (see Chart 2:3 for more detailed discussion).

Implications: Disparities in patient safety are disturbing to reasonable expectations that the health care system should provide a basic level of safety for all. Additional research is warranted to determine how much the racial and ethnic variation documented here results from differing care within the same institution as opposed to differences between institutions that may primarily serve blacks, Asians, and Hispanic Americans. Chart 5:10 documents that black patients are predominantly seen by a small number of physicians who report relatively higher levels of constraints in their ability to deliver high-quality care. Similar constraints might act as barriers to high-quality hospital care for black and possibly Hispanic patients.

Findings: Among elderly patients (ages 65 and older) hospitalized in 2001:

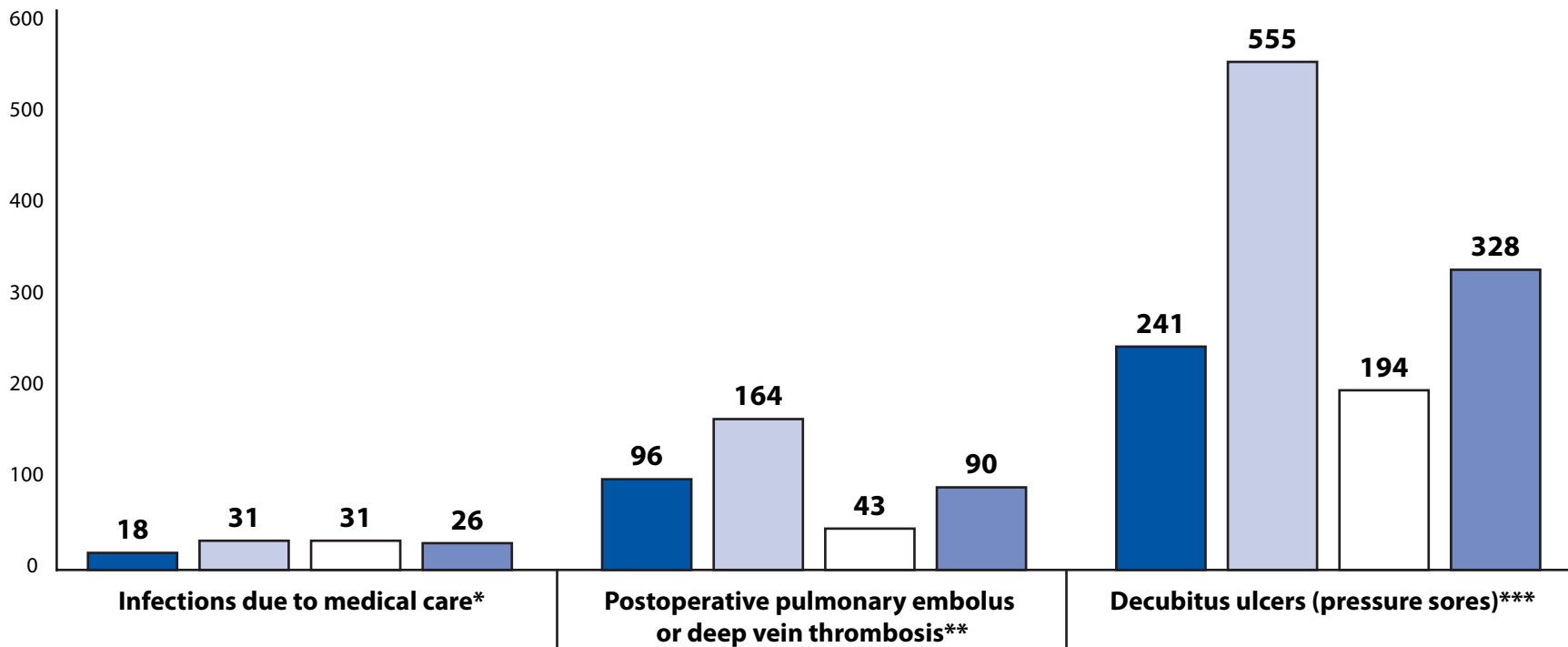
- Black patients were 72 percent more likely than white patients to develop infections related to intravenous lines and catheters, 71 percent more likely to suffer blood clots in their legs or lungs following surgery, and 2.3 times more likely to develop pressure sores.
- Hispanic patients were 72 percent more likely than white patients to develop infections related to intravenous lines and catheters and 36 percent more likely to develop pressure sores.
- Asian/Pacific Islander patients were 44 percent more likely than white patients to develop infections related to intravenous lines and catheters but less likely to suffer blood clots and pressure sores (AHRQ 2005a).

Racial and Ethnic Disparities in Adverse Events and Complications of Care

Some adverse events or complications of care can often be prevented with good medical and nursing care. Compared to white elderly patients, minority elders were more likely to acquire infections in the hospital. Black patients were more likely than white patients to suffer blood clots in their legs or lungs following surgery. Black and Hispanic patients were more likely than whites to develop pressure sores. Asian/Pacific Islander patients were less likely to suffer blood clots and pressure sores.

Risk-adjusted rates of potentially preventable adverse events and complications of care (per 10,000 hospital patients ages 65+ discharged in 2001)

■ White non-Hispanic ■ Black non-Hispanic □ Asian/Pacific Islander non-Hispanic ■ Hispanic



Source: Patient Safety Indicators applied to Health Care Utilization Project State Inpatient Database (AHRQ 2005a). Rates exclude complications present on admission and are adjusted for age, gender, age-gender interactions, comorbidities, and diagnosis-related group clusters. *Infections primarily related to intravenous lines and catheters. **Among surgical patients. ***Among patients with hospital stays of five days or longer. See the Technical Appendix for specific exclusions.



EQUITY • STAYING HEALTHY • CHARTS 5:2 TO 5:4

Disparities in Preventive Care

Why is this important? The provision of effective preventive services is a fundamental aspect of high-quality health care. Disparities in the receipt of preventive care may perpetuate disparities in both short- and long-term health outcomes. Understanding the factors giving rise to disparities in health care can help to identify root causes that are amenable to change by health care professionals or that require changes in wider public policies affecting health care.

Findings: Among community-dwelling elderly adults surveyed during 1998, 2000, and 2001 (AHRQ 2005a):

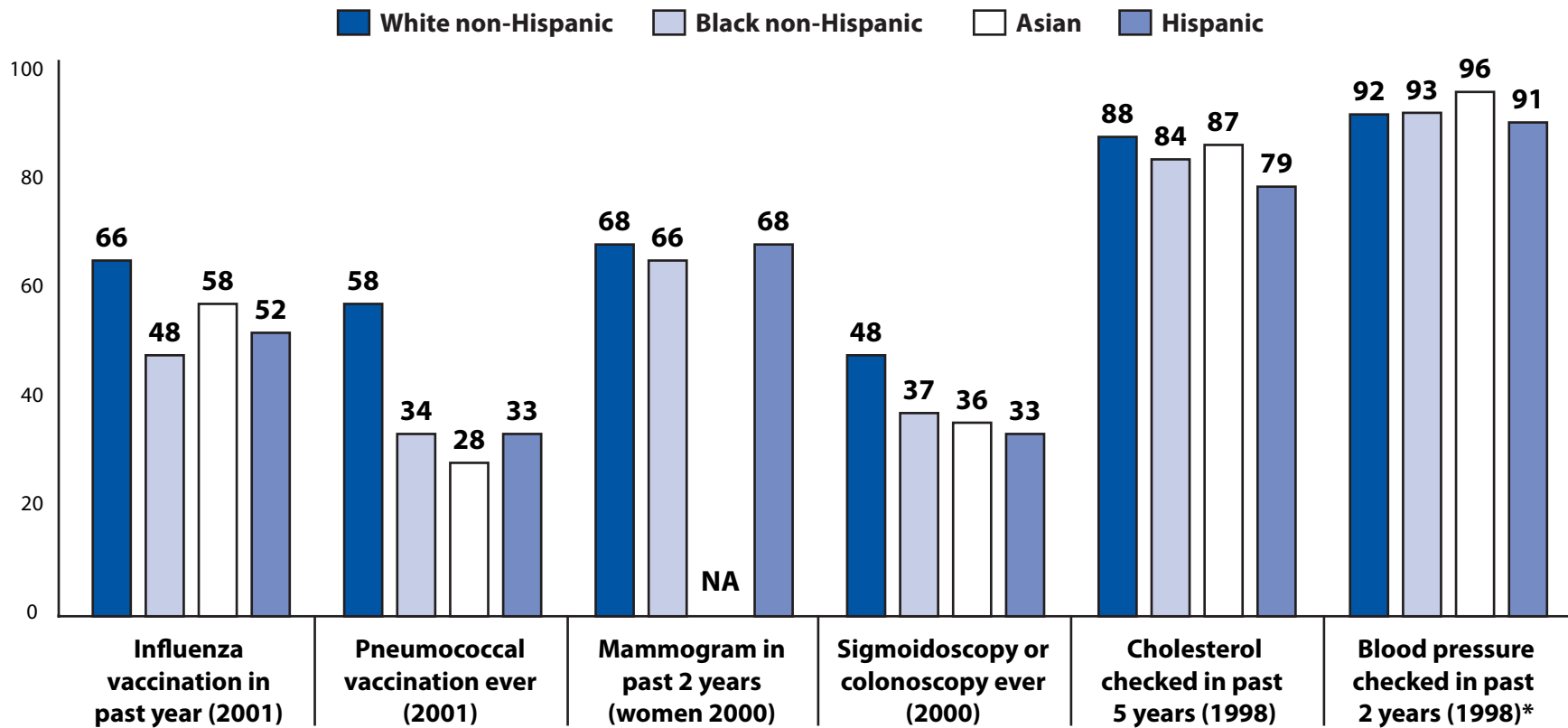
- **Chart 5:2 – By Race and Ethnicity:** minorities were less likely than whites to receive some preventive services such as immunizations and colorectal cancer screening, but rates of care were similar for other services such as mammography and blood pressure testing.
- **Chart 5:3 – By Family Income:** those with higher family income were generally more likely to receive preventive services than those with lower family income. This income disparity in quality was greatest for cancer screening tests, intermediate for vaccination, and least for tests for cardiovascular disease risk factors.
- **Chart 5:4 – By Type of Coverage:** those with private supplemental coverage were generally more likely to receive preventive services than those with Medicaid or no supplemental coverage. There was no clear pattern except that disparity was smallest for blood pressure reading, which is routinely done during physician visits.

Implications: These results were not adjusted for confounding and must be interpreted with caution. For example, those without supplemental coverage are likely to have lower income and vice versa. Socioeconomic factors may have a larger influence on disparities in the receipt of preventive care than race or ethnicity alone (Fiscella et al. 2000). Interventions can be targeted to address access barriers, but cost barriers are more difficult to address without financial assistance of some kind. Almost two of five elderly Americans (38%) live in poverty or near-poverty. The poorest beneficiaries are dually eligible for Medicare and Medicaid. Other low-income Medicare beneficiaries may qualify for assistance through the Medicare Savings Program. However, only about 60 percent of Medicare beneficiaries who are eligible for one of these programs are actually enrolled (Williams 2004).

Disparities in Preventive Care by Race and Ethnicity

Among elderly adults, minorities were often but not always less likely than whites to receive preventive care. Disparities varied by type of service and were generally smaller for services with the highest overall rates of use.

Percentage of community-dwelling adults ages 65+ who reported receiving recommended preventive services



Source: National Health Interview Survey (AHRQ 2005a). Numbers were too small to report mammograms for Asians or any measure for Native Americans. *Blood pressure checked and respondent can state whether it is normal or high.



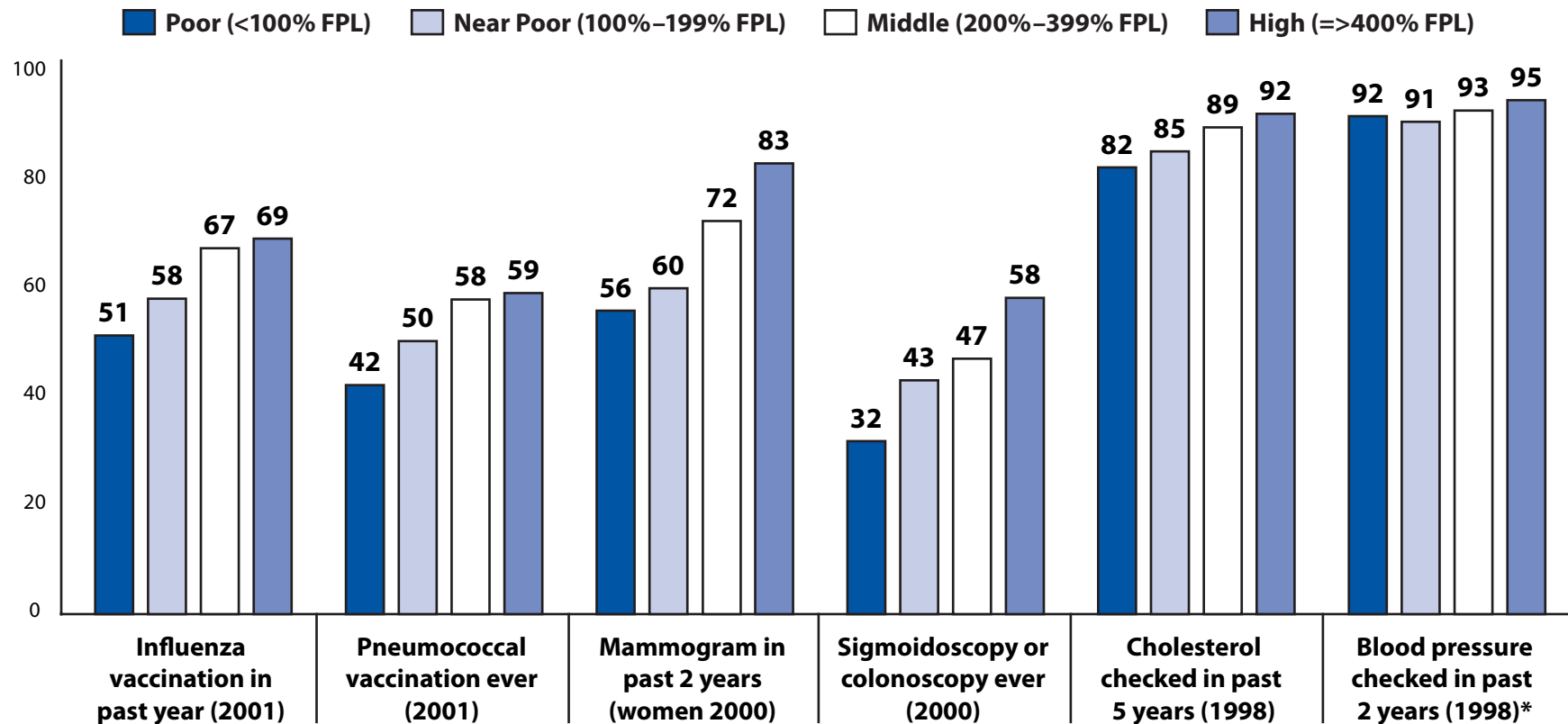
EQUITY • STAYING HEALTHY • CHART 5:3

Disparities in Preventive Care by Family Income Level

Elderly adults with higher family income were generally more likely to receive recommended preventive services than those with lower family income. The disparity was greatest for cancer screening tests and was least for tests for heart and circulatory disease risk factors.



Percentage of community-dwelling adults ages 65+ who reported receiving recommended preventive services

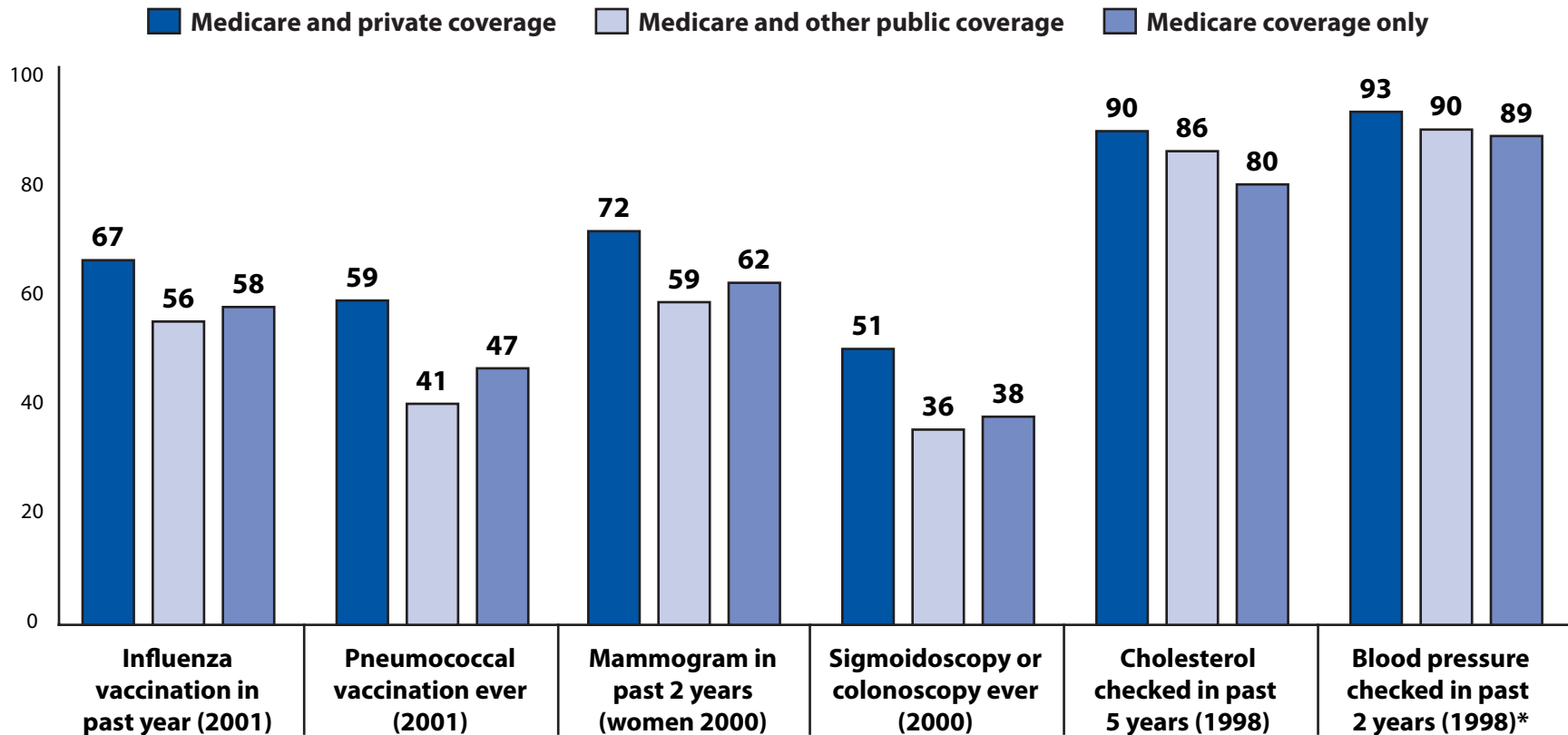


Source: National Health Interview Survey (AHRQ 2005a). *Blood pressure checked and respondent can state whether it is normal or high. FPL = federal poverty level.

Disparities in Preventive Care by Type of Coverage

Elderly Medicare beneficiaries with private supplemental coverage were generally more likely to receive preventive services than those with public supplemental coverage (such as Medicaid) or no supplemental coverage.

Percentage of community-dwelling adults ages 65+ who reported receiving recommended preventive services



Source: National Health Interview Survey (AHRQ 2005a). *Blood pressure checked and respondent can state whether it is normal or high.



EQUITY • STAYING HEALTHY • CHART 5:5

Impact of Medicare Coverage on Receipt of Preventive Care

Why is this important? Thirteen percent of near-elderly adults (ages 55 to 64) did not have health insurance in 2003 (U.S. Census Bureau 2005). Uninsured adults are less likely than those with health insurance to obtain recommended preventive care (Ayanian et al. 2000). Medicare coverage helps improve elderly adults' access to health care (see Chart 4:1). Over time, Medicare has covered more preventive care services. For example, Medicare began covering screening mammography in 1991, subject to patient cost-sharing (GAO 2002a). Cholesterol testing became a Medicare-covered benefit for all beneficiaries in 2005 (CMS 2004b); previously, this test was covered for cardiovascular risk assessment among those with hypertension and diabetes (McWilliams et al. 2003). Although Medicare has covered prostate cancer screening (PSA test or digital rectal exam) in men since 2000, these tests are not currently recommended by the U.S. Preventive Services Task Force because of insufficient evidence to determine their effectiveness (USPSTF 2002e).

Findings: A national survey of adults before and after they became eligible for Medicare at age 65 showed that previously uninsured near-elderly adults had significantly lower rates of preventive screening than insured near-elderly adults; once the uninsured became eligible for Medicare coverage, the disparities in rates of screening were reduced by half or more. A subanalysis (not shown) of individuals with diabetes or hypertension, who are

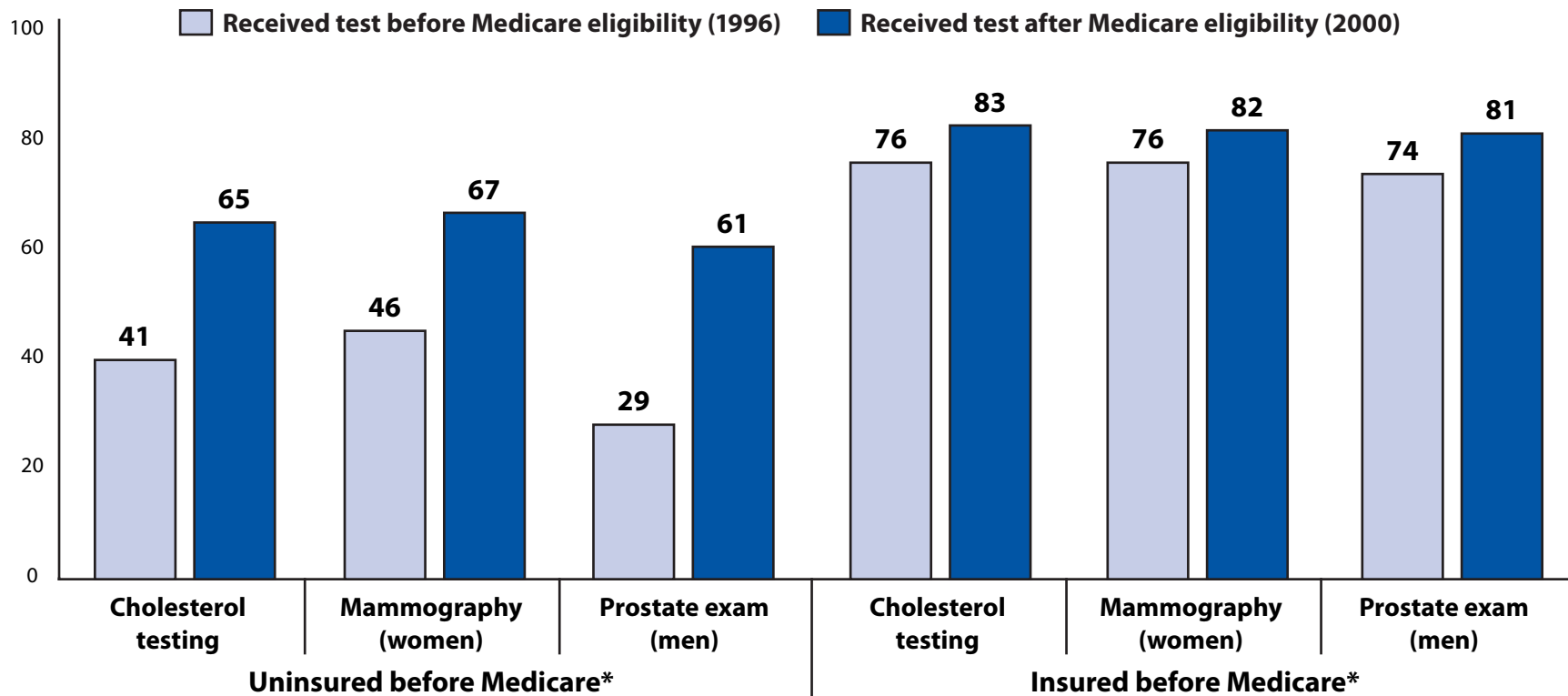
at risk of heart disease, revealed a 29 percent reduction in the gap in cholesterol screening rates between the previously uninsured and insured groups once they became eligible for Medicare coverage, as compared to an 8 percent reduction in the gap among those with neither condition (McWilliams et al. 2003).

Implications: Medicare coverage reduced the gaps in preventive services between previously uninsured and insured adults. Rates of non-recommended screening (prostate exam) increased along with recommended screening. The study authors speculated that socioeconomic factors might contribute to remaining disparities (McWilliams et al. 2003). Adults with diabetes and hypertension, who are generally in need of cardiovascular risk reduction, particularly benefited from health insurance coverage for cholesterol testing. Starting in 2005, Medicare began covering a “Welcome to Medicare” physical exam for newly eligible beneficiaries, which may further enhance the benefit of gaining Medicare coverage for uninsured individuals. Although insurance coverage promotes access to preventive screening, coverage alone is not enough to assure high-quality care.

Impact of Medicare Coverage on Receipt of Preventive Care

After older adults became eligible for Medicare at age 65, existing disparities in screening between those who were previously insured and those who were previously uninsured were greatly reduced, but not eliminated. Screening increased for tests that are recommended based on evidence for their effectiveness, such as cholesterol testing and mammography, and for services that have not been proven effective at improving health outcomes, such as prostate exams.

Among near-elderly adults ages 60–64 in 1996 who became eligible for Medicare at age 65 in the year 2000, percentage who reported receiving screening tests



Source: Health and Retirement Study (McWilliams et al. 2003). *Results are shown only for individuals who were continuously uninsured in both 1994 and 1996 or continuously insured in both 1994 and 1996. Results are not shown for those who were intermittently uninsured (uninsured in 1994 or 1996 but not both).



EQUITY • LIVING WITH ILLNESS • CHART 5:6

Racial and Ethnic Disparities in Chronic Care Management

Why is this important? The *Report of the Secretary's Task Force on Black and Minority Health* (Nickens 1986) first drew attention to disparities in access to medical care for minority Americans. Numerous studies emerging since that time continue to document minority disparities in health care, primarily differences between blacks and whites, and the phenomenon is best documented in the Medicare fee-for-service program in which Americans ages 65 and older receive basic health care coverage (Gornick 2000). Less research has focused on access and quality for racial and ethnic populations other than blacks and whites, the quality of mental health care received by racial and ethnic minorities, or the quality of care received by Medicare beneficiaries enrolled in managed care plans.

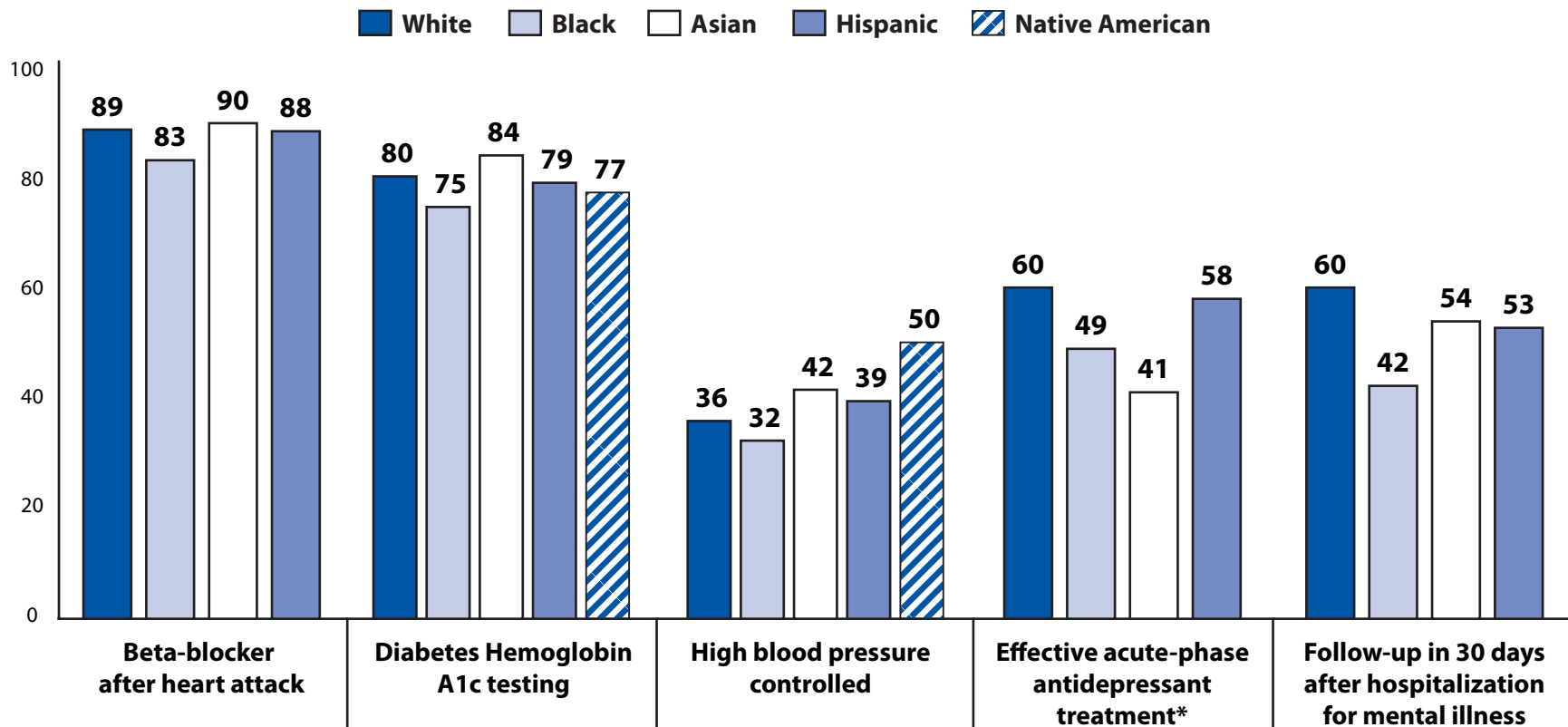
Findings: Among Medicare beneficiaries ages 65 and older enrolled in managed care plans during 1999, blacks consistently received poorer quality of care than whites across all quality measures studied. All minorities received worse quality of mental health care than white patients. For other measures, Asians received equal or better care. Hispanics and Native Americans (when their numbers were large enough to report) were less likely than whites to receive some care but were equally or more likely to receive other types of care (Virnig et al. 2002; Virnig et al. 2004). (Only a subset of measures are shown on the chart but other measures showed similar patterns.)

Implications: The magnitudes and patterns of chronic and mental health care vary between different racial and ethnic groups. Continued measurement of such disparities is important to help guide interventions to ensure equity in access, use, and outcomes across all racial and ethnic groups. Insight as to why these disparities exist in the first place is also sorely needed. One study found that ethnic disparities in care were explained largely by differences in English fluency, but racial disparities in care were not explained by commonly used access factors (Fiscella et al. 2002). Because care is suboptimal for all groups, quality improvement efforts provide the opportunity to achieve the twin goals of equity and effectiveness for all populations.

Racial and Ethnic Disparities in Chronic Care Management

Among Medicare beneficiaries enrolled in managed care plans, blacks were less likely than whites to receive recommended chronic care services and achieve good outcomes. Hispanics, Asian Americans, and Native Americans were less likely than whites to receive some services but equally or more likely to receive other services or achieve good outcomes.

Percentage of Medicare managed care plan members who received services or achieved outcomes in 1999



Source: Analysis of HEDIS by Virnig et al. (2002; 2004). Numbers for Native Americans were too small to report for some measures. "Other" race omitted for clarity. *Those newly diagnosed with depression, prescribed an antidepressant, and who continued using an antidepressant during the 12-week acute-treatment phase.



EQUITY • CARE AT END OF LIFE • CHART 5:7

Racial and Ethnic Disparities in Use of Hospice at End of Life

Why is this important? Hospice is a multidisciplinary approach to health care for the terminally ill that aims to maintain comfort of dying patients while they are cared for at home (see Chart 3:6). Hospice care generally provides symptom management, pain control, spiritual care, and family support. In the U.S. health care system, disparities related to race, ethnicity, and socioeconomic status are pervasive (IOM 2003). Disparities in hospice enrollment may mimic those general disparities because of cultural differences or practical obstacles such as language differences (Lorenz et al. 2004a).

Findings: Hospice use at end of life increased among all Medicare fee-for-service beneficiaries between 1998 and 2002, but it increased most among white beneficiaries. Specifically, hospice use increased 9 percentage points among whites but only 4 to 6 percentage points among black, Asian, and Hispanic Americans during this time. As a result, minorities remain less likely than whites to use hospice (MedPAC 2004b).

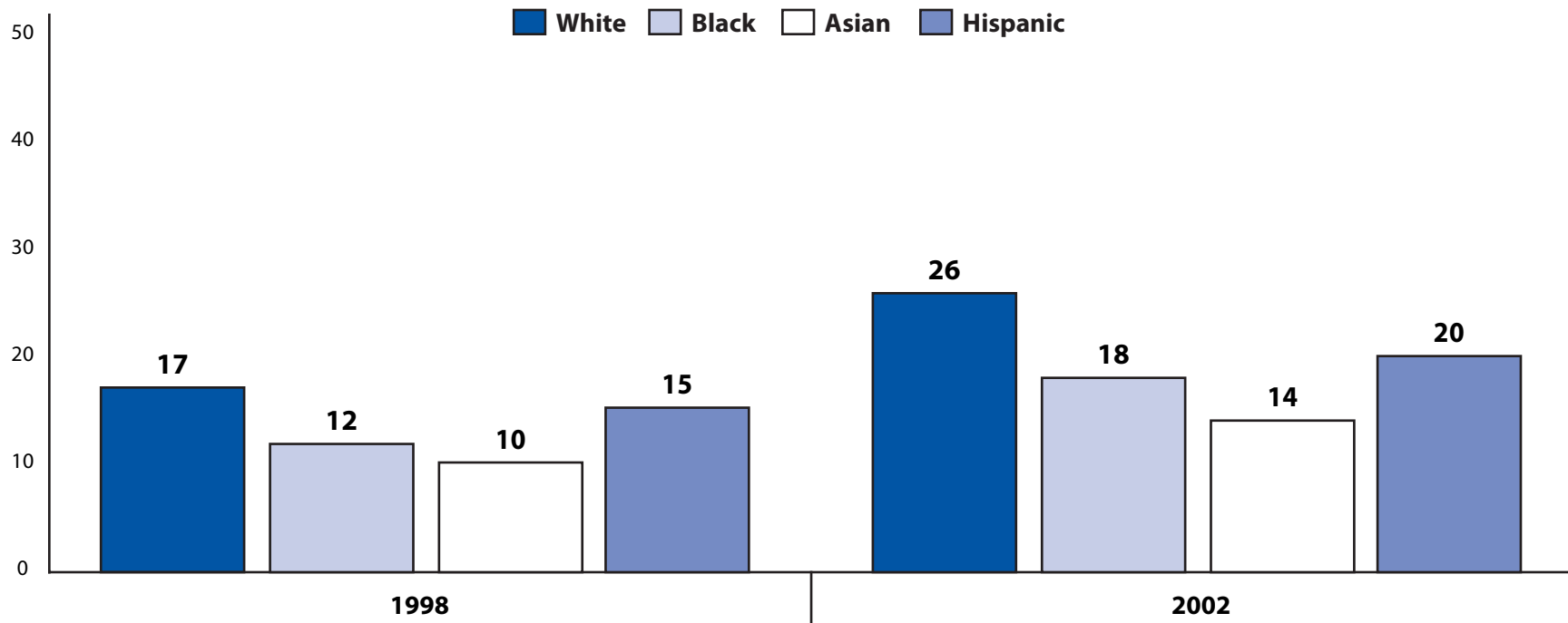
Implications: Cultural issues related to death and dying present unique challenges to offering hospice care to diverse populations (Lorenz et al. 2004a; Lyke and Colon 2004). Low-income, urban African Americans and Latinos report barriers to hospice care related to lack of awareness, language differences (for Latinos), general mistrust of the health care system, and the overall cost of health care (Born et al. 2004). On the other hand, they are receptive to assistance with end-of-life care that provides relief for patients and caregivers and emphasizes spirituality and family.

Addressing the disparities in hospice care among minority Medicare beneficiaries is challenging, but it presents an urgent need for improving end-of-life care for diverse patients. Tailoring hospice services to reduce barriers may increase use and improve satisfaction. Expert recommendations include hiring a diverse staff, providing cross-cultural training programs, offering translation services and diverse spiritual care, and using linguistically and culturally specific outreach materials (Lorenz et al. 2004a; Lyke and Colon 2004). Physicians also have an important role in discussing hospice as an option for terminally ill patients to consider.

Racial and Ethnic Disparities in Use of Hospice at End of Life

Hospice use at end of life increased among all Medicare beneficiaries over the past decade, but increased most among white beneficiaries. As a result, minorities remain less likely than whites to use hospice.

Percentage of Medicare fee-for-service beneficiaries who used hospice at end of life



Source: Medicare Payment Advisory Commission (2004b) analysis of Medicare administrative data.



EQUITY AND EFFICIENCY • CARE AT END OF LIFE • CHART 5:8

Unexplained Variation in Care at End of Life

Why is this important? Medicare per capita spending among regions is closely correlated with use of hospitals, intensive care units, and physician services in managing chronic illness such as congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and solid tumor cancers (Wennberg et al. 2004a). To preserve Medicare's ability to provide universal access for seniors, delivery of effective care in an efficient manner is paramount. To that end, health care institutions require information on their performance over time to assess their efficiency and to identify areas where intervention is needed. Numerous quality indicators exist that can identify the underuse of effective care, but indicators that measure the possible overuse of care in managing chronic illness are much less well developed.

Findings: An analysis of chronically ill Medicare beneficiaries receiving most of their care at 77 of America's best-ranked hospitals during 1999–2000 revealed extensive variation in the amount of care provided to terminally ill patients in their last six months of life.* Rates of service use for cancer patients varied more than fourteen-fold, for COPD patients more than seven-fold, and for CHF patients more than six-fold. Notably, the frequency of services used by patients with one chronic disease were closely correlated with the frequency of services used by patients with other chronic

diseases at a given hospital. These findings suggest that the hospital where patients are treated—rather than the nature of their illness—dictates the amount of care they receive (Wennberg et al. 2004b).

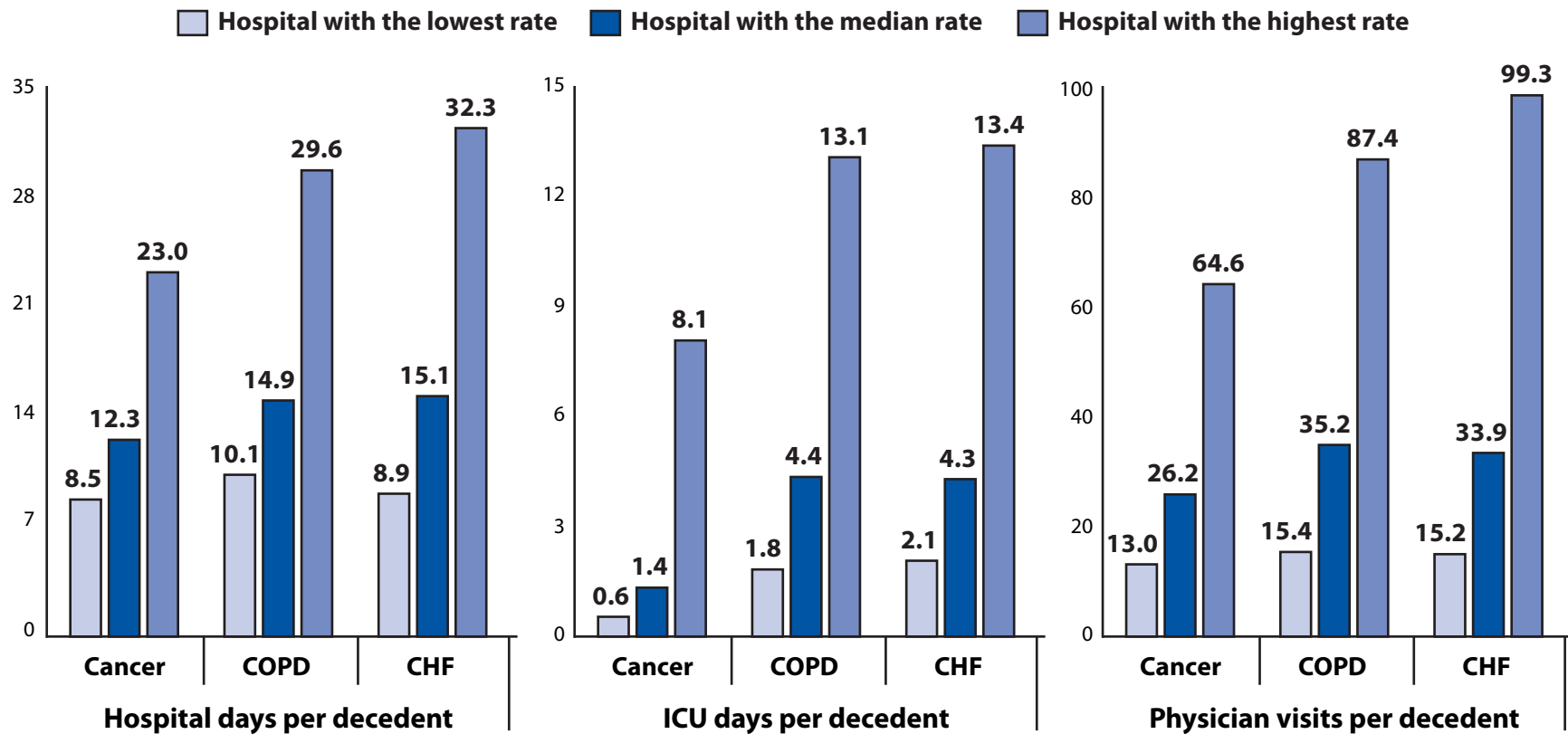
Implications: Medicare claims can be used to measure population-based, provider-specific use of resources for patients enrolled in traditional fee-for-service Medicare. Strikingly wide differences between hospitals exist with regard to the amount of care provided to chronically ill patient populations, and more care does not necessarily equate to higher-quality care (see Chart 5:9). Medicare is testing a pay-for-performance initiative for physician groups, called the Physician Group Practice Demonstration, that will reward physicians for improving the quality and efficiency of health care services delivered to Medicare fee-for-service beneficiaries, especially patients with chronic illness who account for a significant proportion of Medicare expenditures (CMS 2005d).

* Rates of use were case-mix adjusted to control for differences in patients' age, sex, race, and disease comorbidities.

Unexplained Variation in Care at End of Life

Among chronically ill Medicare beneficiaries who received the majority of their care during 1999–2000 at 77 hospitals ranked as the best in America, there was striking variation in use of resources in the last six months of life, suggesting that where one receives care—more than the nature of one’s illness—determines the amount of care that is provided.

Use of services during the last six months of life among Medicare fee-for-service beneficiaries with cancer, chronic obstructive pulmonary disease (COPD), and congestive heart failure (CHF) at 77 U.S. hospitals, 1999–2000



Source: Medicare administrative data (Wennberg et al. 2004b). Rates were case-mix adjusted to control for differences in patients’ age, sex, race, and disease comorbidities. ICU = intensive care unit.



EQUITY AND EFFICIENCY • MULTIPLE CONDITIONS • CHART 5:9

Relationship Between Quality of Care and Medicare Spending

Why is this important? The quality of care delivered to Medicare beneficiaries varies widely by state (see Chart 1:22). The Medicare Quality Improvement Organization program currently measures the effectiveness of care for several indicators such as the administration of beta blockers following a heart attack, mammograms for older women, influenza vaccines, and eye exams for diabetics. These evidence-based practices are beneficial, relatively inexpensive, and (with some exceptions) rarely contraindicated. Differences in the provision of effective care likely depend on multiple factors, which may include Medicare spending levels that differ across the states and the composition of the care provider workforce (i.e., primary care clinicians, physician specialists, registered nurses, and others).

Findings: A national study found that states with higher Medicare fee-for-service spending tend to deliver lower quality care to Medicare fee-for-service beneficiaries, as assessed based on states' overall ranking across 22 quality indicators (see Appendix Table 1a for a list of the indicators included in this study*). Furthermore, for every \$1,000 increase in Medicare spending per beneficiary, a state's quality ranking dropped 10 positions (this inverse relationship between spending and quality is represented by the solid line on the graph). Higher spending was associated with greater use of hospital resources but was not associated with higher patient satisfaction (not shown) (Baicker and Chandra 2004).

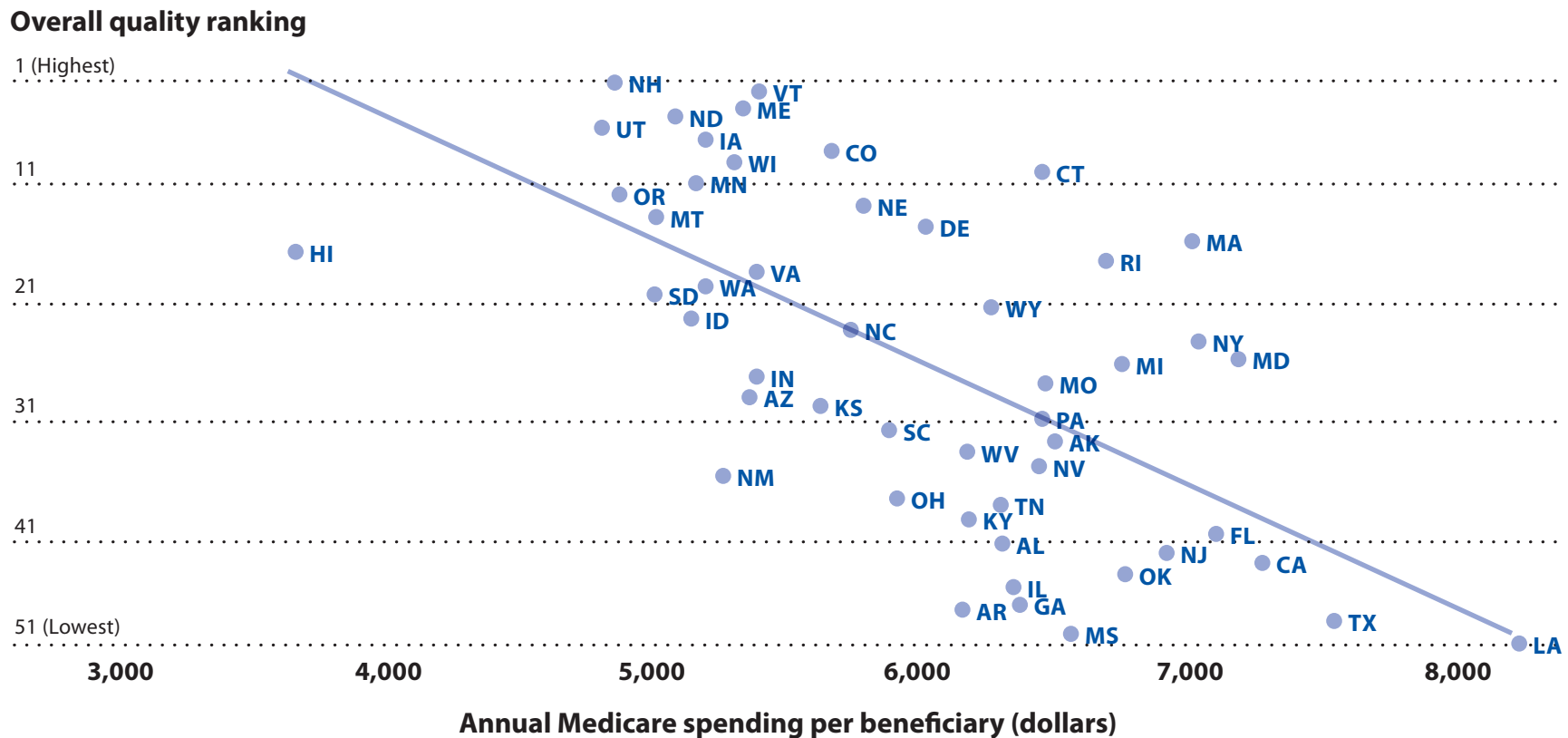
Implications: The authors state that this study “clearly does not suggest that we mandate lower spending, because it is probably not spending per se that reduces quality” (Baicker and Chandra 2004). Moreover, these 22 indicators do not capture all aspects of high-quality care. The composition of the medical workforce accounted for almost half of the state-level variation in Medicare spending per beneficiary. States with a higher proportion of primary care practitioners (vs. specialists) exhibited better performance on these quality indicators and lower costs per beneficiary. Hence, specialists may be clustered in areas where costly care “crowds out” the kinds of effective care measured by this study. The authors suggest that possible interventions in these areas could focus on promoting greater access to primary care clinicians and/or involving specialists in the provision of more effective care. Expanding this type of analysis to include a broader array of representative quality measures would provide a fuller understanding of the relationship between the costs and quality of health care.

* The Medicare Quality Improvement Organization program included 24 quality indicators but two indicators measuring time to reperfusion were excluded from the state rankings described in this chart.

Relationship Between Quality of Care and Medicare Spending

States with higher spending per Medicare beneficiary tended to rank lower on 22 quality of care indicators. This inverse relationship might reflect medical practice patterns that favor intensive, costly care rather than the effective care measured by these indicators.

Relationship between quality and Medicare spending, as expressed by overall quality ranking, 2000–2001



Source: Medicare administrative claims data and Medicare Quality Improvement Organization program data, as analyzed by Baicker and Chandra (2004). The solid line shows that for every \$1,000 increase in Medicare spending per beneficiary, a state's quality ranking dropped by 10 positions. Adapted and republished with permission of *Health Affairs* from Baicker and Chandra, "Medicare spending, the physician workforce, and beneficiaries' quality of care" (Web Exclusive), 2004. Permission conveyed through the Copyright Clearance Center, Inc.



EQUITY • MULTIPLE CONDITIONS • CHART 5:10

Physician Perceptions of Quality of Care for White and Black Patients

Why is this important? Racial disparities exist in the quality of care, and black patients generally receive lower-quality care than white patients (see Chart 5:6). The Medicare program has the potential to help reduce disparities in the quality of health care through the influence of its purchasing and regulatory powers (Eichner and Vladeck 2005), assuming that the causes underlying these disparities can be accurately determined. One contributing factor may be that individuals of different racial groups obtain their care—whether by choice or because of availability—from doctors who differ in their clinical qualifications and/or access to clinical resources.

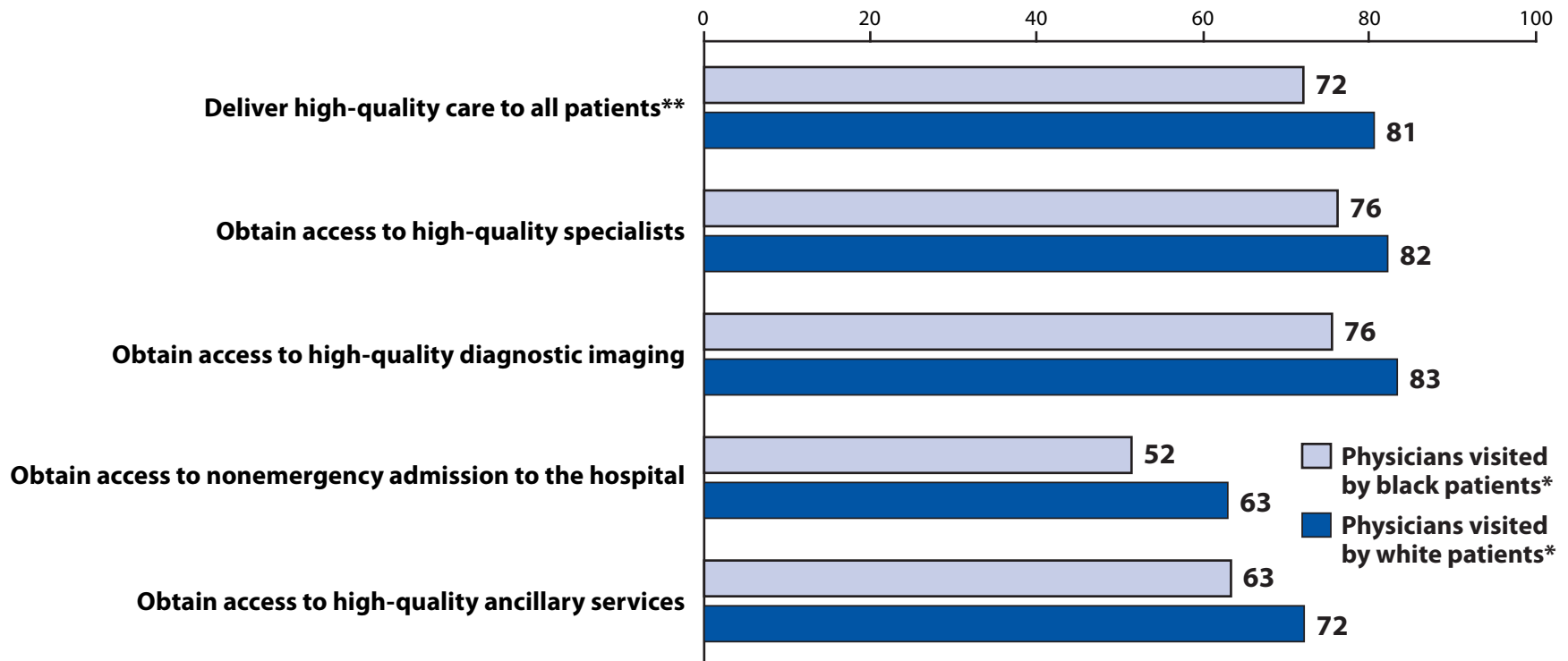
Findings: A study using a nationally representative sample of primary care physicians treating black and white Medicare beneficiaries ages 65 and older in 2000 and 2001 found that 80 percent of black patients received their care from only 22 percent of physicians. In a comparison of visits by white patients and black patients, the physicians visited predominantly by black patients were less likely than those visited predominantly by white patients to agree that they could provide high-quality care to their patients. They were also less likely to report that they could obtain access to high-quality specialists, high-quality diagnostic imaging, nonemergency hospital admissions, and high-quality ancillary services (Bach et al. 2004).

Implications: Visits by black patients were highly concentrated among a small subgroup of primary care physicians who more frequently reported difficulties in gaining access to high-quality services for their patients than those physicians treating white patients. The differences in access to resources between these two groups of physicians could translate into differences in the quality of care delivered to patients. One of the two overarching goals of the U.S. Department of Health and Human Services' Healthy People 2010 initiative is to eliminate health disparities, including differences that occur by race or ethnicity, by providing access to high-quality health care to all individuals (DHHS 2002a). The findings from this study suggest that these efforts must address structural factors that influence physicians' ability to deliver high-quality care.

Physician Perceptions of Quality of Care for White and Black Patients

About 20 percent of physicians deliver care to 80 percent of black patients. As compared with physicians visited predominantly by white Medicare patients, physicians visited predominantly by black Medicare patients were less likely to report that they can deliver and obtain access to high-quality care for their patients.

Among primary care physicians of elderly Medicare fee-for-service beneficiaries, percentage who reported in 2000–2001 that they were able to:



Source: Community Tracking Study Physician Survey linked to Medicare administrative data (Bach et al. 2004).
 *Results are weighted by patient visits and to be nationally representative. **Responses tabulated for this question were agree or somewhat agree; responses tabulated for all other questions were always or almost always.





SECTION 6

Capacity to Improve

This section illustrates the promise of systematic improvements for achieving one or more of the Institute of Medicine's six aims for the health care system: effective, safe, timely, patient-centered, equitable, and efficient health care.

CAPACITY TO IMPROVE • STAYING HEALTHY • CHART 6:1

Improving Pneumococcal Vaccination Screening in the Hospital

Why is this important? Little more than half of the elderly have received the pneumococcal vaccine despite the recommendations of experts and the fact that Medicare will pay for vaccination (see Chart 1:1). To help improve vaccination rates, the American Thoracic Society and the Infectious Diseases Society of America support vaccinating patients at risk for community-acquired pneumonia when they are hospitalized (Niederman et al. 2001; Mandell et al. 2003). Many elderly patients hospitalized with pneumonia have been admitted to the hospital before, which suggests that a hospital stay provides a good opportunity to identify those who should be vaccinated to help prevent future hospitalizations for pneumococcal infections (Fedson et al. 1990). In 2002, only 26 percent of Medicare patients were screened for or received a pneumococcal vaccination while hospitalized with pneumonia (AHRQ 2005b).

Intervention: This study evaluated the impact of a year-long pneumococcal vaccine educational intervention for Louisiana State University (LSU) internal medicine primary caregivers (i.e., house staff). The intervention was based on recommendations from the Advisory Committee on Immunization Practices (CDC 1997) and included:

- lectures reviewing the benefits and indications of pneumococcal and other commonly accepted vaccinations,
- reinforcement of these concepts at monthly physician orientation meetings, and
- posted reminders for pneumococcal vaccination.

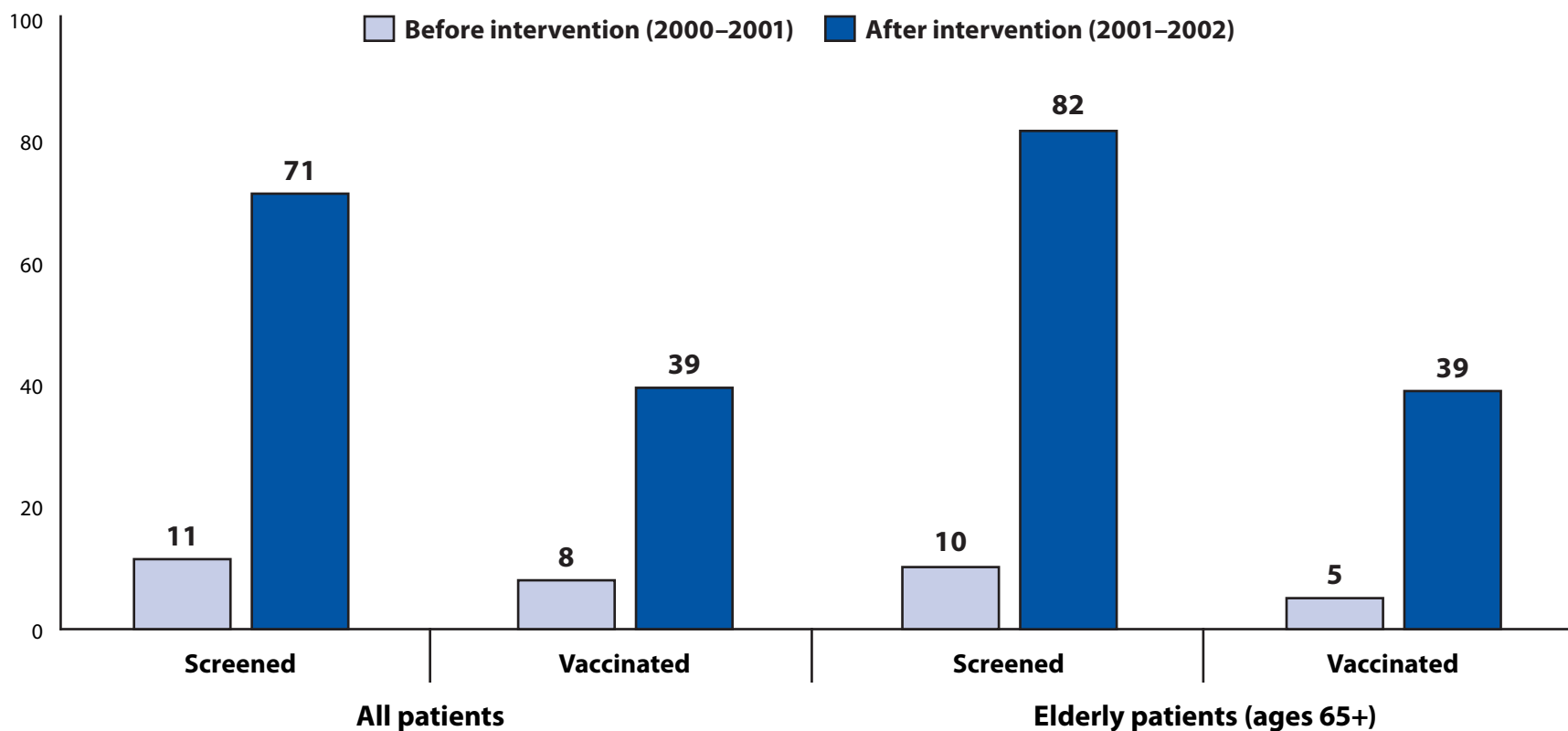
Findings: In the year following the intervention, the number of inpatients with pneumonia who were screened to determine their vaccination status while hospitalized at the Medical Center of Louisiana increased by 60 percentage points among all patients and by 72 percentage points among elderly patients. The proportion who received the vaccination increased by 31 percentage points among all patients and by 34 percentage points among the elderly (Kruspe et al. 2003).

Implications: This educational intervention provides one model for increasing pneumococcal vaccination rates among hospital patients. The Medicare program also permits the use of “standing orders” authorizing vaccination by nurses and pharmacists without the need for a physician’s examination and direct order (CDC 2003a). Medicare has eliminated financial barriers by reimbursing hospitals for pneumococcal vaccination of Medicare beneficiaries in addition to regular payment for patients’ care under the prospective payment system (CDC 1997). Educational initiatives such as this one, in combination with standing orders, may offer the most time-efficient and effective solution for improving pneumococcal vaccination rates among high-risk patients.

Improving Pneumococcal Vaccination Screening in the Hospital

An intensive educational intervention for internal medicine physicians at a teaching hospital significantly improved the proportion of pneumonia patients who were screened to determine whether they had received a pneumococcal vaccination and the proportion who were given the vaccine when needed to prevent severe pneumococcal disease.

Among patients hospitalized for pneumonia at an academic medical center, percentage who were screened for and/or received pneumococcal vaccination



Source: Kruspe et al. 2003. Results based on review of patient records (N = 240 pre- and 194 post-intervention).



CAPACITY TO IMPROVE • GETTING BETTER • CHART 6:2

Improving Hospital Treatment for Heart Attack

Why is this important? The American College of Cardiology and the American Heart Association first published evidence-based guidelines for the management of heart attack patients in 1996. Many patients still do not receive all the therapies recommended in the guidelines (see Chart 1:8). Better adherence to evidence-based therapy could help prevent many of the 300,000 recurrent heart attacks that occur annually (AHA 2005b).

Intervention: Ten acute-care hospitals in southeast Michigan implemented the American College of Cardiology's Guidelines Applied in Practice (GAP) quality-improvement project, which is designed to incorporate national heart attack treatment guidelines into care practice. The one-year GAP intervention consisted of customizing guideline-based tools, assigning local physician and nurse opinion leaders, performing grand rounds site visits, and measuring quality indicators among random samples of patients who were ideal candidates for therapy. The control group consisted of 11 Michigan hospitals that volunteered for but were not selected to participate in the intervention, although they were encouraged to undertake improvements in heart attack treatment (Mehta et al. 2002).

Findings: Three GAP-promoted tools (standard admission orders, clinical pathways, and standard discharge forms) were documented for about one-quarter of patients in GAP-participating hospitals. Among Medicare patients for whom

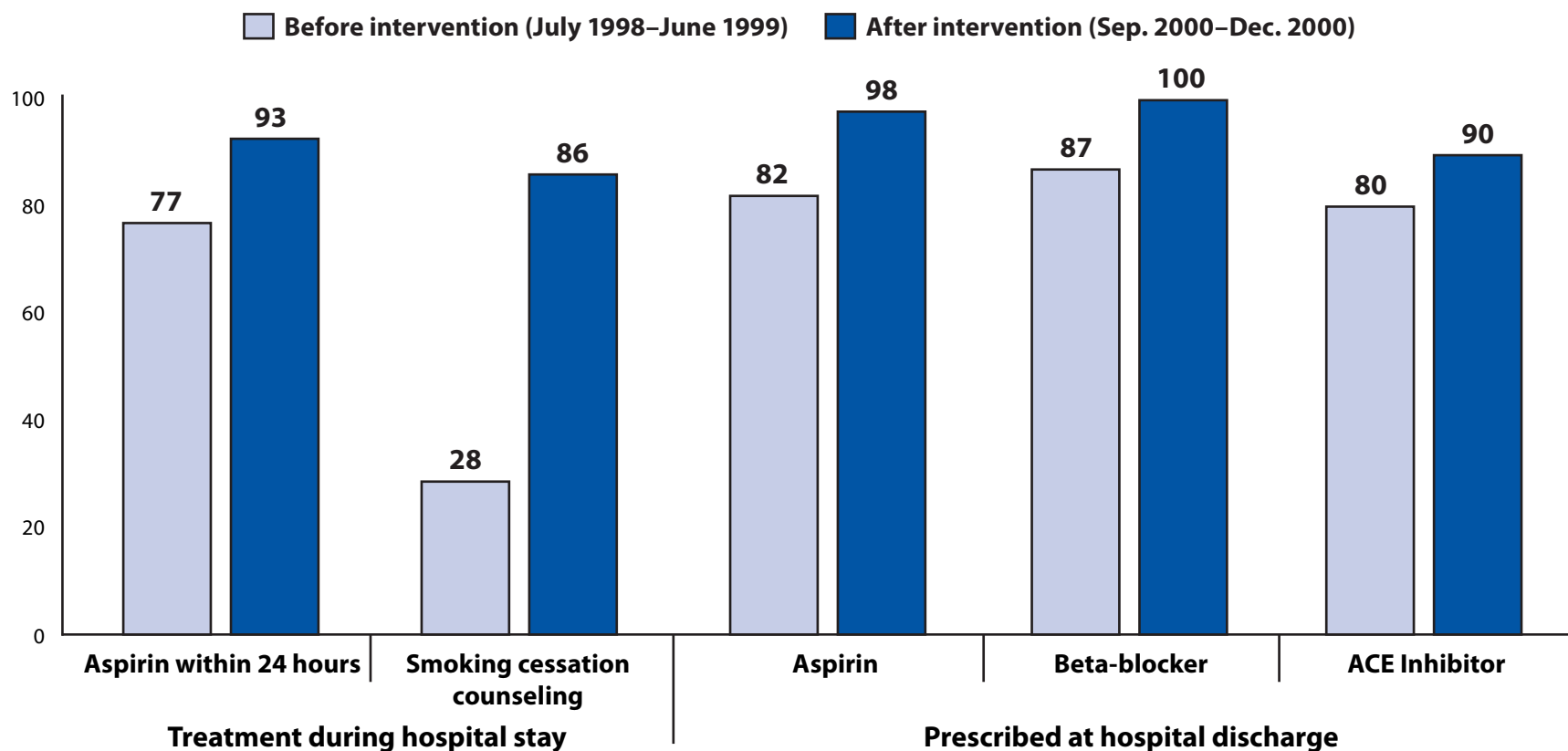
GAP tools were used, five of six quality indicators showed significant improvement compared to control hospitals: aspirin administration within 24 hours of admission and smoking cessation counseling increased by 16 and 58 percentage points, respectively, and prescription of aspirin, beta blockers, and ACE inhibitors at discharge increased by 16, 13, and 10 percentage points, respectively, from before to after the intervention. Among all Medicare beneficiaries, GAP-participating hospitals showed a significant improvement only in prescribing aspirin at discharge compared with control group hospitals (data not shown). Overall, the intervention effect tended to be greatest among older patients (those ages 75 and older). Furthermore, the intervention showed signs of equalizing treatment among white and nonwhite patients (Mehta et al. 2002).

Implications: The authors attributed the success of the GAP intervention to the development of tools that reinforce the key goals of heart attack therapy, the identification of implementation barriers, the flexibility of the intervention, and the advantage of established relationships from prior quality-improvement initiatives. Because tool use correlated with the greatest improvements in quality measures, future initiatives might emphasize a longer implementation period with insistence on routine tool use (Mehta et al. 2002).

Improving Hospital Treatment for Heart Attack

Medicare heart attack patients at 10 southeast Michigan hospitals were more likely to receive evidence-based treatment after the hospitals engaged in a structured intervention that included customized, guideline-oriented tools, local physician and nurse opinion leaders, grand rounds site visits, and measurement of quality indicators.

Among a subset of Medicare heart attack patients at 10 hospitals for whom improvement tools were used, percentage who received recommended treatment to prevent a recurrent heart attack



Source: American College of Cardiology Guidelines Applied in Practice (GAP) Initiative (Mehta et al. 2002). Results are based on random samples of medical records for patients who were ideal candidates for therapy during baseline (N = 515) and intervention (N = 663). ACE = angiotensin converting enzyme.



CAPACITY TO IMPROVE • LIVING WITH ILLNESS • CHART 6:3

Reducing Rehospitalization for Congestive Heart Failure

Why is this important? Older adults with multiple chronic health conditions and complex medication regimens are at high risk for poor outcomes following discharge from the hospital, which often leads to hospital readmission (Naylor 2002). Elders suffering from congestive heart failure—a life-threatening condition in which the heart cannot pump enough blood to meet the body’s oxygen needs—have the highest rate of rehospitalization among adult patients (AHA 2005b).

Intervention: Elderly patients ages 65 and older who were hospitalized with heart failure at one of six Philadelphia area hospitals during 1997 to 2001 were randomly assigned to receive either a transitional care intervention delivered by specially trained advanced practice nurses (APNs) or usual care. Guided by a flexible, evidence-based protocol, the APNs collaborated with physicians to provide individualized needs assessment, care planning, patient education, and therapeutic support during the patient’s hospitalization and in a series of home visits for three months after discharge. APNs were available seven days a week for telephonic patient support (Naylor et al. 2004). (This care management approach is known as the Quality-Cost Model of Advanced Practice Nursing Transitional Care.)

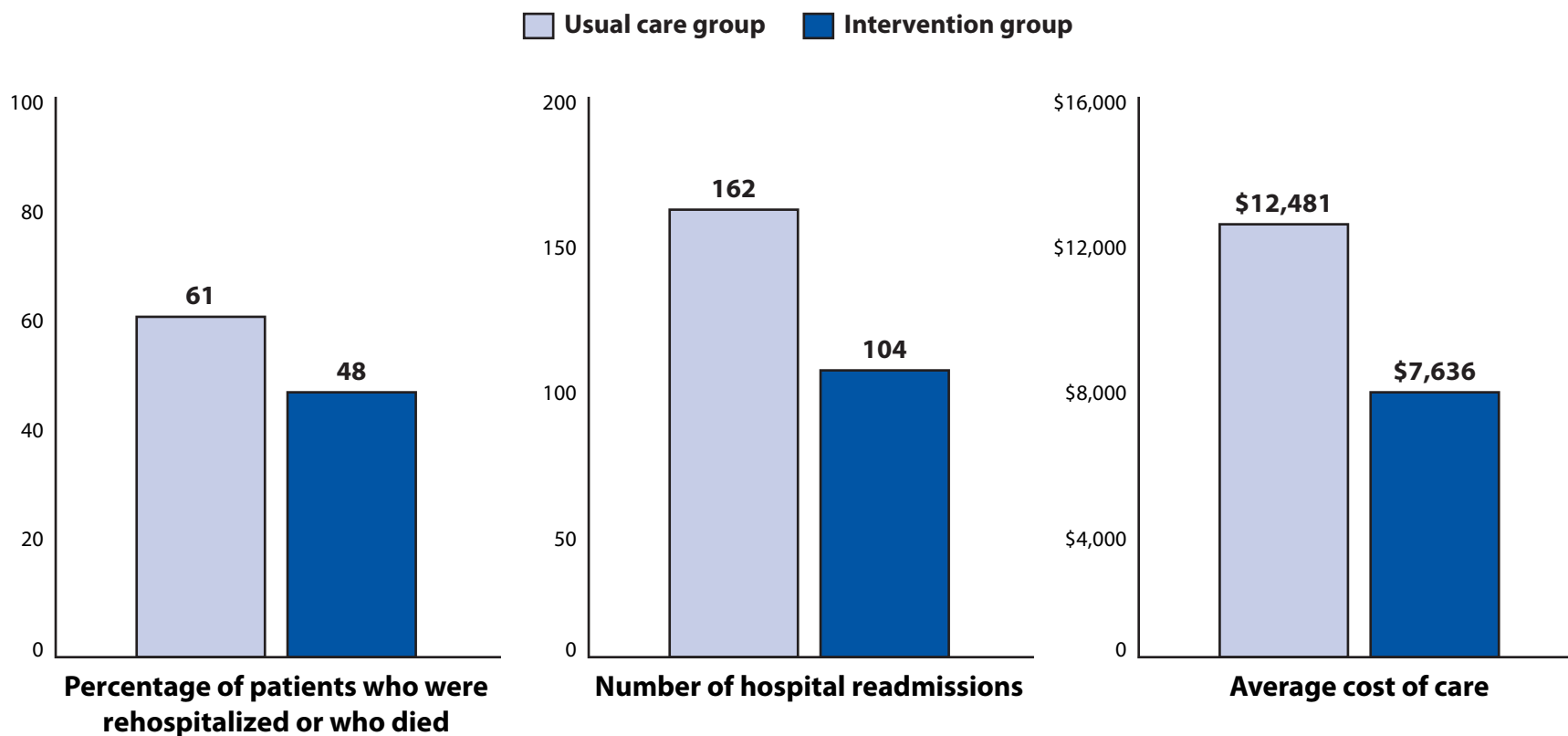
Findings: At one year after hospital discharge, patients who received the transitional care intervention were less likely to have been readmitted to the hospital or to have died; also, they had 36 percent fewer hospital readmissions than patients who received usual care. The total cost of care for the intervention group was \$4,845 (39%) lower per patient than for the usual care group, after accounting for the cost of the intervention (Naylor et al. 2004).

Implications: The authors attributed the success of this intervention to increased continuity of care and the individualized, holistic approach that APNs took to address patients’ complex care needs. A meta-analysis of 18 other randomized controlled trials found that comprehensive discharge planning plus post-discharge support (of varying intensity) for patients with heart failure reduced hospital readmissions by 25 percent on average (Phillips et al. 2004). Implementing such a program nationally for all Medicare beneficiaries could prevent up to 84,000 hospital readmissions each year.

Reducing Rehospitalization for Congestive Heart Failure

Elderly patients hospitalized for heart failure were less likely to be readmitted to the hospital or to die and had lower health care costs overall when they received transitional care from an advanced practice nurse who provided needs assessment, care planning, patient education, and therapeutic support through discharge planning and home follow-up visits.

Resource use among congestive heart failure patients ages 65+ treated at six Philadelphia hospitals during 1997–2001 who were randomly assigned to receive a three-month transitional care intervention or usual care



Source: Medical records and patient interviews (N = 239) (Naylor et al. 2004).



CAPACITY TO IMPROVE • LIVING WITH ILLNESS • CHART 6:4

Improving Depression Treatment and Outcomes

Why is this important? Depressed older adults report poorer quality of life, are at increased risk of death because of medical illness or suicide, and use more medical services than nondepressed older adults (see Chart 1:19). Efforts to improve the treatment of the depressed elderly through patient screening and practitioner education have fallen short of expectations, suggesting that a more comprehensive intervention strategy is needed (Unutzer et al. 2002).

Intervention: Patients ages 60 and older who were treated at one of 18 primary care clinics affiliated with eight diverse organizations received either usual care or a care intervention delivered by specially trained nurses or psychologists (depression clinical specialists) in collaboration with the patient's primary care physician. Working under the supervision of a psychiatrist and primary care expert and guided by evidence-based protocols, depression care specialists conducted initial visits, devised treatment plans, and maintained weekly or biweekly contact (in person or by telephone) with patients for up to 12 months. Care included initiation of antidepressant medication and/or psychotherapy followed by regularly scheduled assessments to maintain or amend treatment (Unutzer et al. 2001).

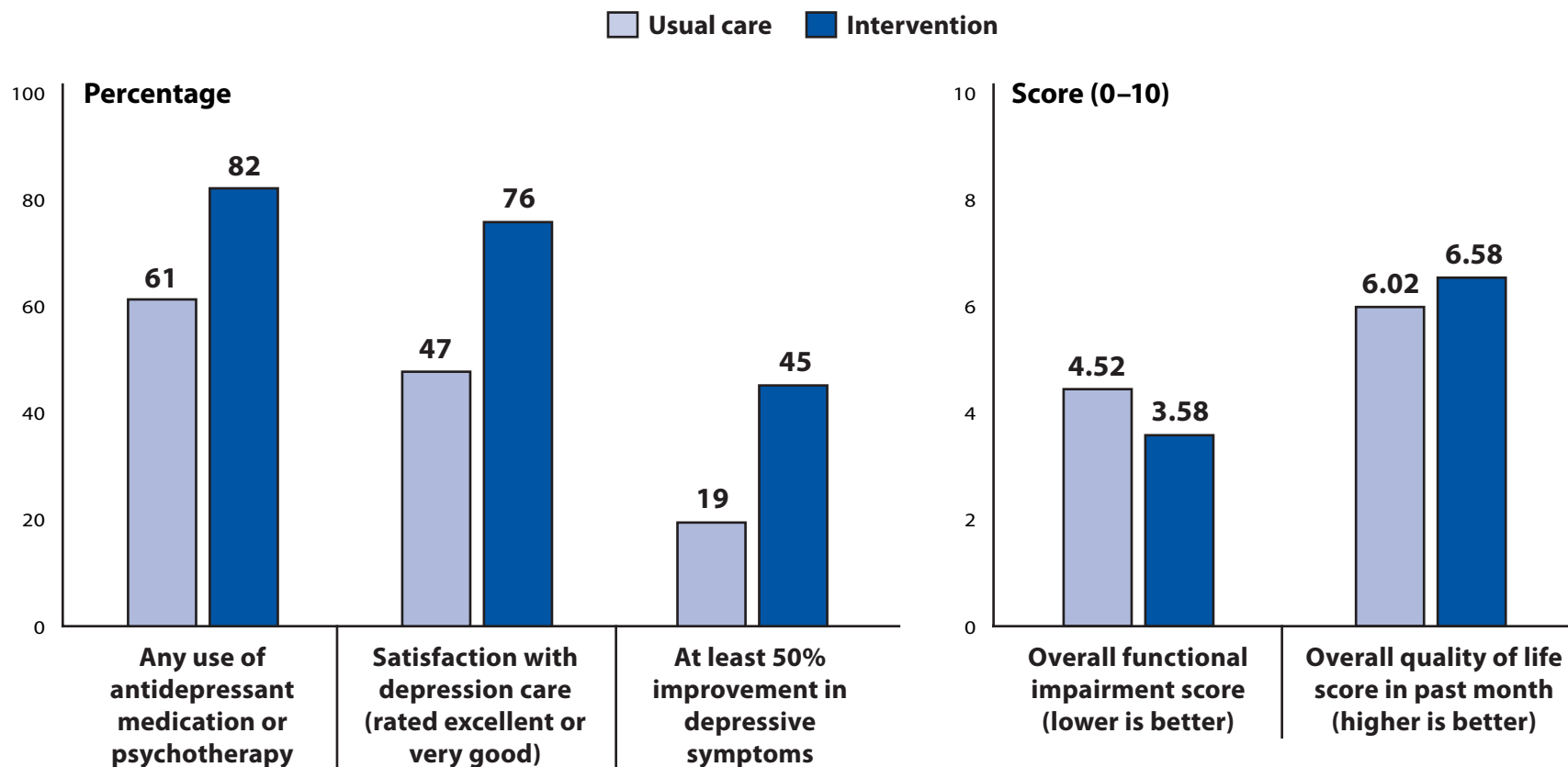
Findings: One year after the study began, 21 percent more intervention patients were using antidepressant medication or psychotherapy, 29 percent more were satisfied with their depression care, and 26 percent more demonstrated at least a 50 percent improvement in depressive symptoms than those receiving usual care. The self-reported functional impairment score was 21 percent lower and the quality of life score was 9 percent higher for the intervention group compared to usual care (Unutzer et al. 2002).

Implications: This model offers a promising approach to improving depression care among elderly patients. Improvements were seen across all participating organizations, suggesting that this approach is feasible in diverse primary care settings. Treatment of late-life depression is challenging, reflected by the fact that less than 50 percent of patients receiving this intervention reported at least a 50 percent decrease in depressive symptoms. The investigators predict that the 12-month intervention cost of \$553 per patient will likely offset health care costs otherwise incurred by this population, which are up to 50 percent higher than for older adults without depression (Unutzer et al. 2002).

Improving Depression Treatment and Outcomes

Older adults with depression were more likely to receive treatment and to be satisfied with care and achieved better outcomes when assigned to a trained nurse or psychologist who collaborated with the patient and primary care physician to support medication management and/or provide brief psychotherapy, under supervision of a psychiatrist and primary care expert.

Treatment and outcomes at 12 months among adults ages 60+ with depression and/or dysthymia randomly assigned to a care management intervention or usual care in 8 health care organizations during 1999–2001



Source: Improving Mood: Promoting Access to Collaborative Treatment (IMPACT) program (Unutzer et al. 2002). Results based on patient interviews (N = 1,801).



CAPACITY TO IMPROVE • LIVING WITH ILLNESS • CHART 6:5

Supporting Caregivers of Patients with Alzheimer's Disease

Why is this important? Family caregivers looking after relatives with Alzheimer's disease often experience a great deal of psychological distress, which may ultimately lead to depression and compromise their caregiving ability. A recent nationwide study found that 32 percent of family caregivers of patients with moderate to severe dementia reported six or more symptoms of depression or were classified as depressed (Covinsky et al. 2003).

Intervention: Spouses (average age 71 years) caring for patients with Alzheimer's disease at home were randomly assigned to receive either enhanced counseling and support or usual services from the New York University Alzheimer's Disease Center. Each caregiver in the intervention group was assigned a counselor who provided six individual and family counseling sessions and ongoing ad hoc counseling customized to the needs of each caregiver (e.g., techniques for managing difficult patient behavior and facilitating family communication). Caregivers in the intervention group attended weekly support group meetings for continuous emotional support and education. Usual services consisted of information and advice services and access to ad hoc counseling and support groups on request (Mittelman et al. 2004).

Findings: During the first year of the study, caregivers receiving enhanced services demonstrated a gradual decrease in symptoms of depression, whereas those receiving usual services showed an increase in depressive symptoms. Although the difference in depression scores decreased in magnitude with increasing time, caregivers in the intervention group had significantly lower depression scores than those in the usual care group more than three years (161 weeks) after enrollment. The median time before Alzheimer's patients were placed in a nursing home was almost 11 months (329 days) longer for those being cared for by caregivers receiving the intervention than by those receiving usual services (Mittelman et al. 1996; Mittelman et al. 2004).

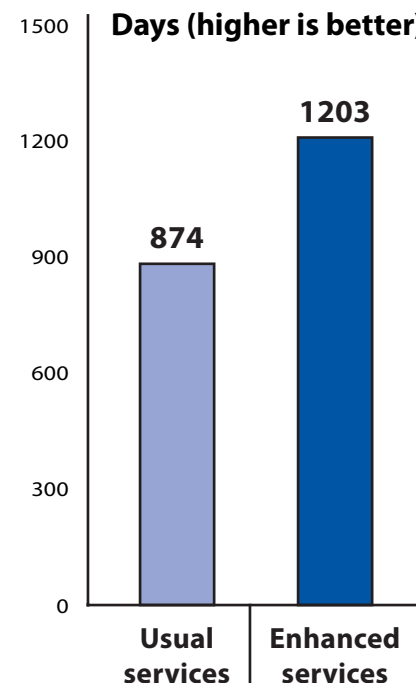
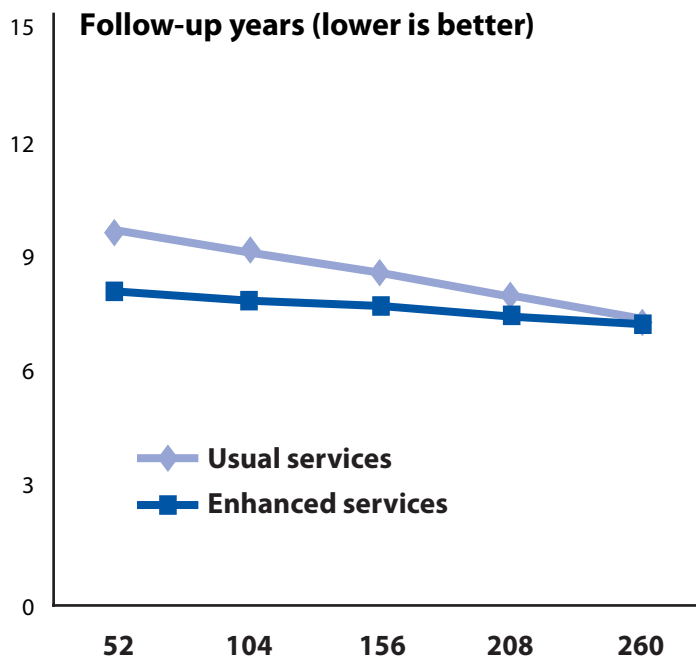
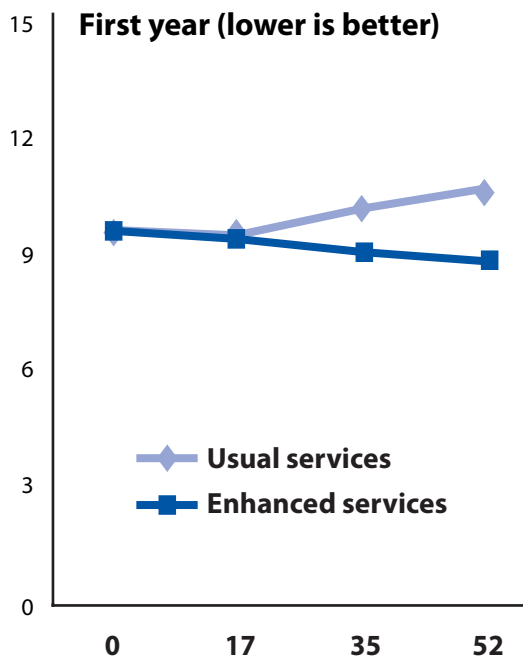
Implications: A short course of intensive counseling and ongoing support can have long-lasting effects in reducing symptoms of depression among family caregivers of Alzheimer's patients, permitting Alzheimer's patients to be cared for at home almost one year longer before needing institutional care. The sustained effects of the intervention might be attributable to its flexibility and ability to help caregivers develop long-term coping skills and resources (Mittelman et al. 2004). Wider availability of interventions such as this might improve quality of life for the 25 million families caring for Alzheimer's patients and potentially reduce the family and societal costs of care for Alzheimer's disease.

Supporting Caregivers of Patients with Alzheimer’s Disease

Family members who care for patients with Alzheimer’s disease often experience psychological distress. Providing spouse-caregivers with enhanced counseling and ongoing support reduced their burden of depression compared to those who received usual supportive services; this positive effect was sustained over three years on average. Alzheimer’s patients whose spouses received enhanced services were cared for at home nearly a year longer before being institutionalized.

Depression scores* among 406 spouse-caregivers of Alzheimer's patients randomly assigned to enhanced caregiver services or usual care, 1987–1996

Median time before nursing home placement



Elapsed time in weeks since patient study enrollment

Source: New York University Spouse-Caregiver Intervention Study (Mittelman et al. 1996, 2004). Results based on caregiver interview (N = 406) using the Geriatric Depression Scale. *Depression scores were covariate adjusted to equalize rates at baseline. Depression score charts reprinted with permission from the *American Journal of Psychiatry*, Copyright 2004, American Psychiatric Association.



CAPACITY TO IMPROVE • CHANGING NEEDS • CHART 6:6

Improving Home Health Care Outcomes

Why is this important? The goals of home health care include “assisting patients to become or remain sufficiently independent to stay in their home environment, avoiding institutional long-term care or acute care” to the degree possible (Shaughnessy et al. 2002a). Although hospital admissions are sometimes planned or necessary to provide optimal care and assure patients’ health, some hospitalizations represent adverse outcomes resulting from preventable events, such as falls or acute exacerbations of chronic conditions. Home health agencies (HHAs) might be able to reduce such adverse outcomes through proactive needs assessment and coordination with the patient’s physician to provide timely care interventions in the home.

Intervention: The federal government, in collaboration with New York State and the Robert Wood Johnson Foundation, developed the Outcome-Based Quality Improvement (OBQI) system to support continuous quality improvement in HHAs (Shaughnessy et al. 2002b). Using the Outcome and Assessment Information Set (see Chart 1:21), patient assessments are centrally collected and analyzed to produce annual reports comparing an agency’s performance with a national reference for 41 risk-adjusted outcomes measures. HHAs use these reports to target outcomes for improvement, investigate care processes to determine problems, identify best practices to improve care, plan and implement actions to achieve those practices, and monitor effectiveness. For example, one agency’s plan to reduce unplanned hospitalizations included criteria to identify patients with unstable conditions or otherwise in need of follow-up care

and a protocol for nurses to contact the patient’s physician within 24 hours to schedule a follow-up call or visit (Richard et al. 2000).

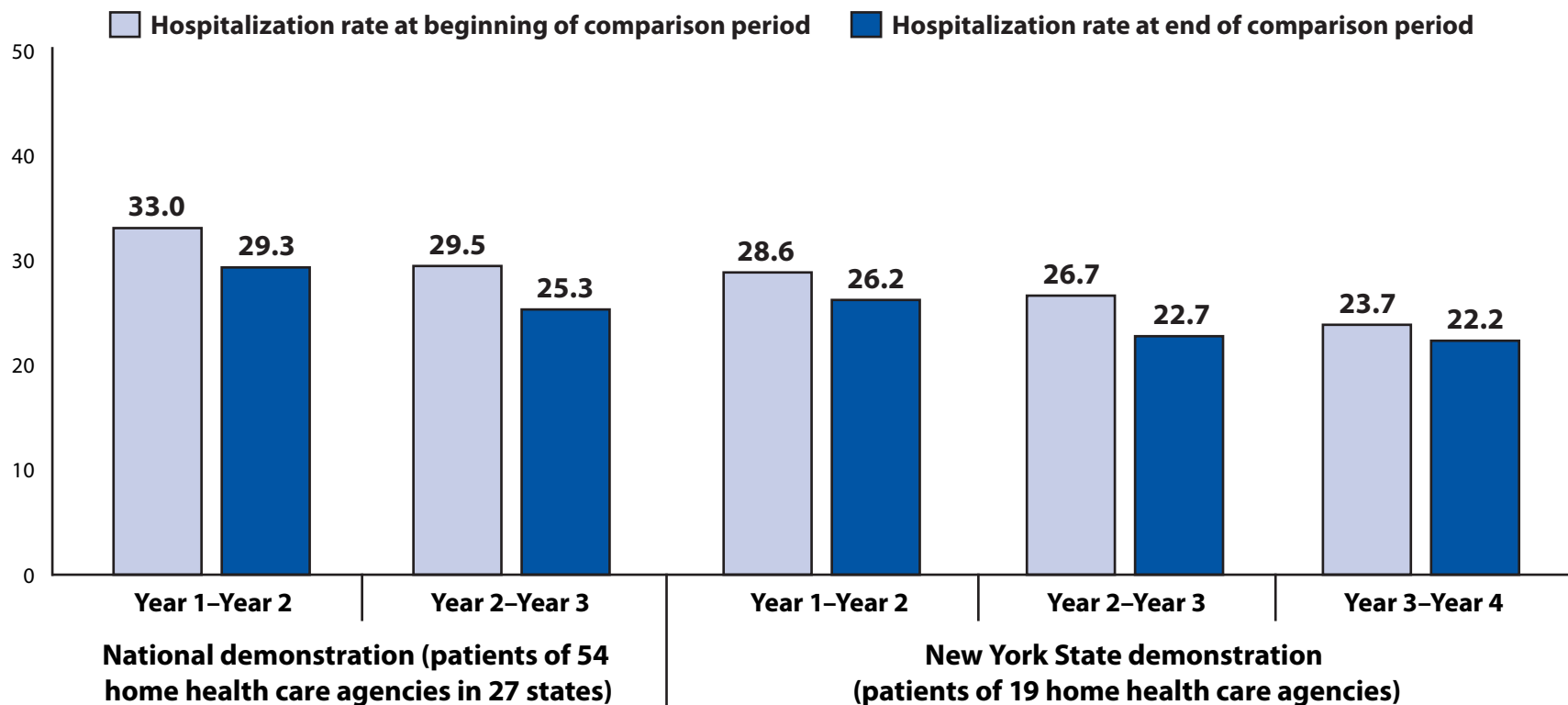
Findings: Through participation in a national OBQI demonstration program, which included training and technical assistance to implement OBQI, 54 HHAs in 27 states reduced risk-adjusted hospitalization rates by 22 percent over three years. The 19 HHAs participating in a New York State demonstration achieved a similar reduction of 26 percent over four years. In contrast, hospitalization rates changed only very little for a random sample of non-OBQI Medicare patients in the same 27 states during the three-year national demonstration. Other targeted patient outcomes improved 5 to 7 percent per year versus an improvement rate of about 1 percent for nontargeted outcomes in participating HHAs (data not shown) (Shaughnessy et al. 2002a).

Implications: The authors noted that physician involvement was an important factor in agency-level improvement and that most agencies needed to improve communication with physicians to achieve this effect. Although use of OBQI is voluntary, the federal government has collaborated with state agencies to offer training on the OBQI system to HHAs nationwide. Medicare Quality Improvement Organizations (QIOs) also are helping HHAs implement OBQI. The Centers for Medicare and Medicaid Services has proposed that QIOs work more closely with HHAs to improve selected outcomes, with a focus on reducing hospitalizations (CMS 2004c).

Improving Home Health Care Outcomes

Home health care agencies participating in a national demonstration program used regular reports on their patients' outcomes to plan and make improvements in care. The hospitalization rate fell by 22 percent over three years among agencies nationally and by 26 percent over four years among New York State agencies.

Risk-adjusted percentage of patients hospitalized among home health care agencies that participated in a demonstration of outcomes-based quality improvement during 1995–1999



Source: Reprinted with permission of Blackwell Publishing from Shaughnessy PW, et al. Improving patient outcomes of home health care. *Journal of the American Geriatrics Society* 2002; 50(8): 1354–64. Results are based on Outcome and Assessment Information Set (OASIS) patient assessments (N = 157,548 national and 105,917 New York State). Rates differ between comparison periods because of risk-adjustment and the number of participating agencies in each comparison period.



CAPACITY TO IMPROVE • CHANGING NEEDS • CHART 6:7

Program of All-Inclusive Care for the Elderly (PACE)

Why is this important? The Medicaid program pays for the costs of long-term care for impoverished elderly adults. Many states find it financially difficult to reimburse providers of traditional nursing home care while concurrently developing home and community-based alternatives to institutional care, which many elders prefer. Furthermore, the failure to integrate Medicare and Medicaid funding fragments health care and drives up costs (NPA 2002).

Intervention: PACE provides comprehensive medical and social services to frail and impaired Medicare beneficiaries ages 55 and older who would otherwise need nursing home care but are able to live in the community. Enrollees must be eligible for Medicaid or self-pay the portion of costs that Medicaid would pay. Service delivery is centered around attendance at an adult day health center an average of three days per week, although the program pays for services in any setting under capitated funding. An interdisciplinary care team of clinical and social services professionals assesses participant needs, develops care plans, and delivers all services, thus creating an integrated, comprehensive care plan (Chatterji et al. 1998; NPA 2002).

Findings: Frail elderly who participated in a PACE demonstration project for one year reported a shift in the types of services they received in the past six months and the settings in which they received them. Relative to a comparison group, PACE participants had 80 percent more ambulatory care visits but 60 percent fewer nurse visits to their home; they spent 67

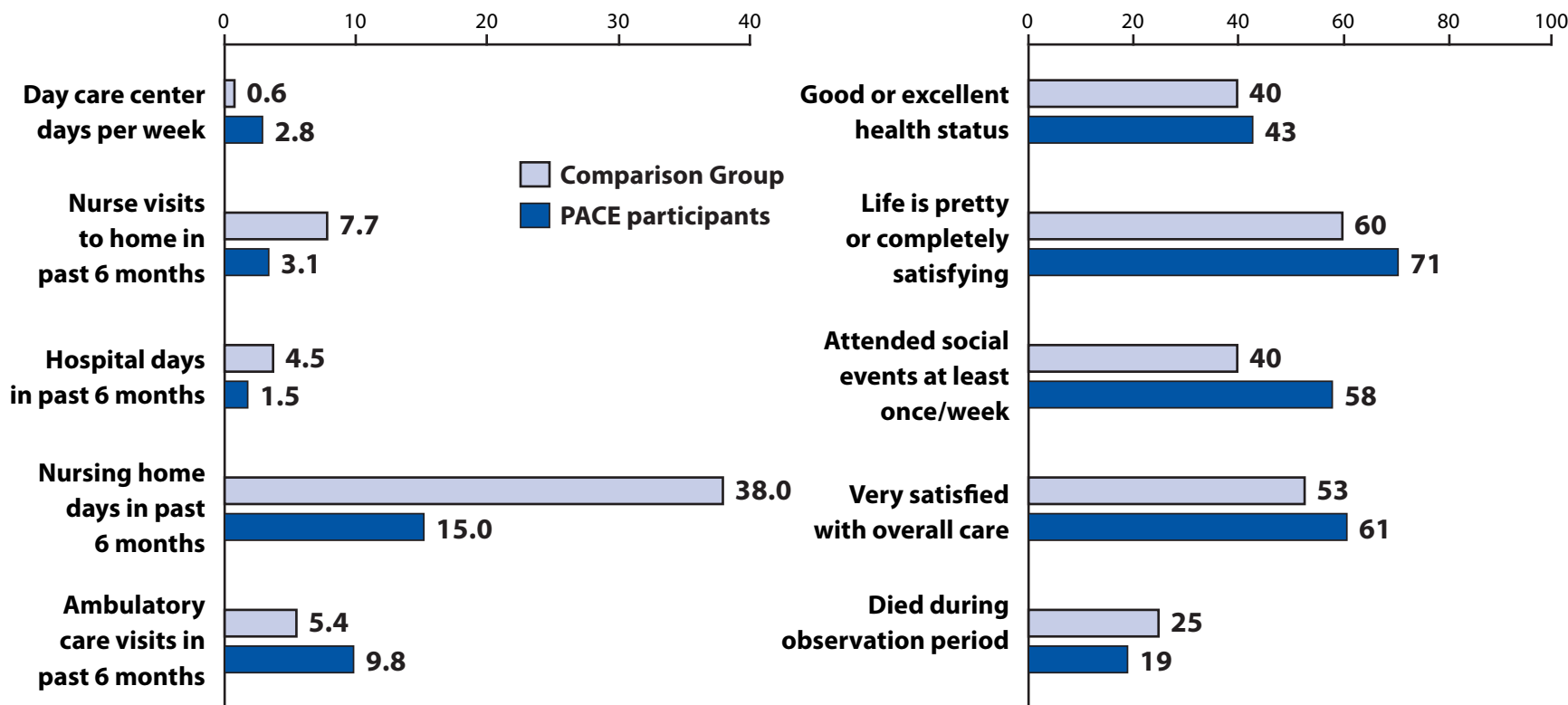
percent fewer days in the hospital and 61 percent fewer days in a nursing home. Although self-reported health status was similar between groups, PACE participants reported better quality of life, higher satisfaction with care overall, and more social contact than the comparison group. Notably, 24 percent fewer PACE participants died during the 12-month observation period (Chatterji et al. 1998).

Implications: A multivariate survival analysis indicated that PACE participants had a median life expectancy of 5.2 years versus 3.9 years for those in the comparison group (Chatterji et al. 1998). Moreover, black patients enrolled in PACE for one year had lower mortality rates and less decline in activities of daily living than white patients (Tan et al. 2003). Medicare costs were 38 percent less during the first six months of enrollment in PACE and 16 percent less during the second six months than if individuals had continued to receive fee-for-service Medicare (White 1998). These outcomes led Congress to make PACE a permanent Medicare program in 1997. Currently, more than 10,500 individuals are enrolled in 73 PACE centers nationwide (NPA 2002). Despite early success, PACE expansion has lagged behind the congressional authorization for up to 190 PACE programs to be operating by 2004, indicating a need to overcome barriers to its widespread implementation (Gross et al. 2004).

Program of All-Inclusive Care for the Elderly (PACE)

PACE serves frail elders eligible for Medicare and Medicaid who are at risk of nursing home placement. Health care and supportive services are provided by an interdisciplinary team focused around attendance at an adult day care center. Participants enrolled in a PACE demonstration during 1995 to 1997 in 11 cities spent fewer days in a hospital or nursing home, had equal or better outcomes, and were less likely to die during the demonstration than those in a comparison group.

Average use of services measured at 12-month follow-up **Percentage with selected outcomes at 12-month follow-up**



Source: Patient interviews conducted for the PACE demonstration evaluation (N = 783) (Chatterji et al. 1998). All differences between PACE and comparison, except in health status, were statistically significant in regression analyses controlling for baseline characteristics.



CAPACITY TO IMPROVE • CARE AT END OF LIFE • CHART 6:8

Expanding Palliative Care Options at the End of Life

Why is this important? The leading causes of death among persons ages 65 and older include congestive heart failure, cancer, stroke, and chronic obstructive pulmonary disease (CDC 1999). The health care system has failed to provide an adequate continuum of care for these individuals, who often cycle between bouts of acute hospital care followed by home health care (IOM 1997). Many patients find that acute care at the end of life causes pain, discomfort, and distress to themselves and their families (Baker et al. 2000). Moreover, although most people say they would prefer to die at home, one-half of Americans die in the hospital and almost one-quarter die in nursing homes (BMS 2004). Many patients who desire and would benefit from palliative care may not be admitted to hospice if they desire to continue receiving some ongoing complex services (Lorenz et al. 2004b).

Intervention: The Kaiser Permanente Palliative Care Project is an interdisciplinary home-based system of health care designed to provide patients suffering from life-threatening chronic conditions with the option of continuing to receive curative care while gradually transitioning to receive more palliative care at the end of life. Palliative care enhances comfort and improves patients' quality of life through the provision of symptom control and pain relief, emotional and spiritual support, and patient education. The central care team consists of the patient and family plus a physician, nurse, and social worker (Brumley et al. 2003a; 2003b).

Findings: Patients enrolled in the palliative care program with congestive heart failure, chronic obstructive pulmonary disease, or cancer were more satisfied with the care they received (measured 60 days after enrollment) and more likely to die at home compared to those who received usual Medicare home health care before dying. Those receiving palliative care received 2.6 times more home health care visits and reported half as many visits to the physician, 75 percent fewer hospital days, and 80 percent fewer nursing home days as those in usual care. The average cost of personal health care services (not including facility charges) in the intervention group was \$6,580 (45%) lower per patient than for the usual care group (not shown). Patients died an average of 102 days after enrolling in the palliative care program (Brumley et al. 2003a, 2003b; personal communication with Susan Enguidanos 2005).

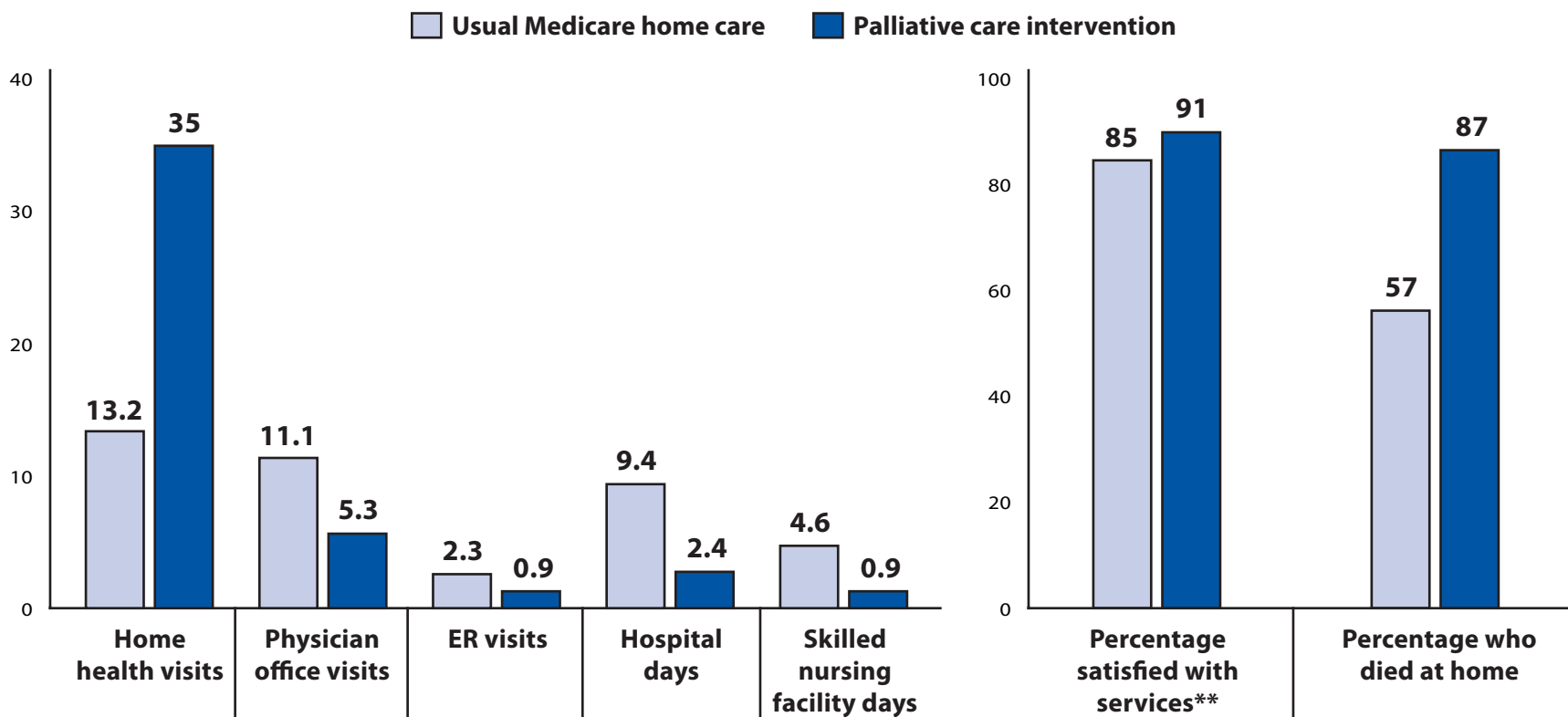
Implications: The authors suggest that by introducing palliative care to chronically ill patients before the onset of dramatic functional declines, patients nearing the end of life can better manage their care to their own satisfaction in their homes. The Robert Wood Johnson Foundation's Promoting Excellence in End-of-Life Care program at the University of Montana is working with several organizations to create similar flexible, innovative palliative care options in diverse care settings (Promoting Excellence 2001).

Expanding Palliative Care Options at the End of Life

Kaiser Permanente designed an innovative palliative care program for patients with life-threatening chronic illnesses who don't yet qualify for hospice and wish to maintain their options for receiving curative care while gradually obtaining more supportive care at home as their condition worsens.

This program allowed more participants to receive services and die at home rather than in an institution—an outcome most people say they desire—with increased satisfaction and at lower cost.

Service use* and outcomes among patients who died from congestive heart failure, chronic obstructive pulmonary disease, or cancer while enrolled in the intervention or receiving usual care during 1999–2000



Source: Adapted and reprinted from *The Permanente Journal* <www.kp.org/permanentejournal> 7(2), Brumley RD, Enguidanos S, Hillary K, The palliative care program, 7-12, Copyright 2003, by permission of the publisher, The Permanente Medical Groups. *Service use based on administrative records and adjusted for days enrolled, congestive heart failure diagnosis, and severity of illness (N = 300). **Satisfaction measured by patient interview 60 days after enrollment.





Appendices

Tables 1a and 1b. Medicare Quality Improvement Organization Program Results for Medicare Fee-for-Service Beneficiaries

Table 2. HEDIS Quality of Care Results for Managed Care Plans

Technical Appendix

Appendix Tables

TABLE 1a. Medicare Quality Improvement Organization Program Results for Medicare Fee-for-Service Beneficiaries

	MEDIAN STATE RATES				WEIGHTED NATIONAL AVERAGES			
	1998–1999	2000–2001	Absolute Change	Relative Change*	1998–1999**	2000–2001	Absolute Change	Relative Change*
HEART ATTACK***								
Aspirin given within 24 hours of admission	84	85	3	15	82	84	2	10
Aspirin prescribed at discharge	85	86	2	14	83	84	1	6
Beta-blocker given within 24 hours of admission	64	69	6	17	62	68	6	17
Beta-blocker prescribed at discharge	72	79	7	28	71	78	7	23
ACE Inhibitor prescribed at discharge (when indicated)	71	74	4	10	71	71	0	1
Smoking cessation counseling during hospitalization	40	43	3	5	38	38	0	0
HEART FAILURE***								
Evaluation of ejection fraction (LVEF)	65	70	5	14	63	71	8	22
ACE Inhibitor prescribed at discharge (when indicated)	69	68	-4	-10	68	66	-2	-6
STROKE***								
Warfarin prescribed at discharge for atrial fibrillation	55	57	3	7	53	57	4	8
Antithrombotic prescribed at discharge for stroke or TIA	83	84	2	12	80	83	3	13
Avoidance of sublingual nifedipine for acute stroke	95	99	4	77	94	99	5	78
PNEUMONIA								
Antibiotic given within 8 hours of hospital arrival	85	87	2	10	83	85	2	12
Antibiotic selection consistent with current guidelines	79	85	7	32	76	84	8	34
Blood culture drawn (if done) before antibiotic	82	82	-2	-9	83	81	-2	-9
Influenza vaccination screening	14	27	9	10	15	24	9	11
Pneumococcal vaccination screening	11	24	11	12	11	23	12	13
IMMUNIZATION (AGES 65+)								
Influenza vaccination in past year	67	72	5	16	66	71	5	14
Pneumococcal vaccination ever	55	65	10	22	54	64	10	22
BREAST CANCER (WOMEN AGES 50-69)								
Mammogram in past 2 years	55	60	5	11	56	60	4	10
DIABETES (AGES 18-75)								
Hemoglobin A1c test in past year	70	78	8	29	61	70	9	28
Eye exam in past 2 years	68	70	1	4	73	74	1	3
Lipid profile in past 2 years	60	74	16	38	59	76	17	40
LOWEST RATE	11	24	-4	-10	11	23	-17	-9
MEDIAN STATE	70	73	4	13				
HIGHEST RATE	95	99	16	77	94	99	17	78

Source: Centers for Medicare and Medicaid Services, Quality Improvement Organization program (Jencks et al. 2003). Adapted and used with permission from: Journal of the American Medical Association, Jan. 15, 2003, 289: 310. Copyrighted © 2003, American Medical Association. All Rights reserved. Some numbers may not add because of rounding. TIA = transient ischemic attack.*Relative change = absolute change / (100 - baseline).

Approximate weighted average rates for 1998–1999 were calculated by chartbook authors by subtracting absolute change from 2000–2001 average rates; actual rates may differ slightly because of rounding.*Excludes patients with documented contraindications to the medications. ACE inhibitor measured for those with left ventricular systolic dysfunction

TABLE 1b. Medicare Quality Improvement Organization Program
Results for Medicare Fee-for-Service Beneficiaries

	UNWEIGHTED NATIONAL AVERAGES			
	2000–2001	2002	Absolute Change	Relative Change*
PNEUMONIA				
Blood culture drawn (if done) before antibiotic	81	81	-0	-1
Antibiotic given within 4 hours of hospital arrival	NA	63	NA	NA
Antibiotic selection consistent with current guidelines**	85	68	-17	-106
Influenza vaccination screening	26	28	1	2
Pneumococcal vaccination screening	25	26	1	2
HEART ATTACK***				
Aspirin given within 24 hours of admission	85	85	0	1
Aspirin prescribed at discharge	86	87	2	11
Beta-blocker given within 24 hours of admission	69	76	7	23
Beta-blocker prescribed at discharge	79	82	3	14
ACE Inhibitor prescribed at discharge (when indicated)	74	67	-7	-27
Smoking cessation counseling during hospitalization	43	50	7	12
HEART FAILURE***				
Evaluation of ejection fraction (LVEF)	69	76	7	22
ACE Inhibitor prescribed at discharge (when indicated)	66	65	-1	-3

Source: Centers for Medicare and Medicaid Services, Medicare Quality Improvement Organization program (AHRQ 2005b). These data are not comparable to data in Table 1a because of differences in the way that averages were calculated. The chartbook authors calculated absolute and relative change using reported rates. Some numbers may not add because of rounding.

*Relative change = absolute change / (100 - baseline).

**Guidelines were updated in 2002.

***Excludes patients with documented contraindications to the medications. ACE inhibitor measured for those with left ventricular systolic dysfunction. Note: The decrease in rate of ACE inhibitor use from 2000–2001 to 2002 might reflect substitution of angiotensin receptor blockers (ARBs).

TABLE 2. HEDIS Quality of Care Results for Managed Care Plans*

TOPIC	MEASURE	MEDICARE MANAGED CARE PLANS		EMPLOYER-SPONSORED MANAGED CARE PLANS	
		2000	2003	2000	2003
Immunization (ages 50-64 or 65+)	Flu shot in past year	NA	74.5	NA	48.0
Breast cancer screening (women ages 52-69)	Mammogram in past 2 years	73.9	74.0	74.5	75.3
Colorectal cancer screening (ages 52-80)	Colorectal cancer screening test in appropriate interval	NA	49.5	NA	47.4
Smoking cessation counseling (ages 18+)	Medical assistance to quit smoking (current smokers)	59.7	63.3	66.3	68.6
Osteoporosis management (women ages 67+)	Osteoporosis screening or treatment following a fracture	NA	18.0	NA	NA
Heart attack treatment (ages 35+)	Beta-blocker treatment after a heart attack	89.3	92.9	89.4	94.3
Cholesterol management after heart attack (ages 18-75)	Cholesterol screening	70.6	81.0	74.2	80.3
	Cholesterol control (LDL<130)	52.9	66.7	53.4	65.1
	Cholesterol control (LDL<100)	NA	49.6	NA	47.6
Controlling high blood pressure (ages 46-85)	Adequate blood pressure control (<=140/90 mmHg)	46.7	61.4	51.5	62.2
Comprehensive diabetes care (ages 18-75)	Eye exam in past year	62.8	64.9	48.1	48.8
	Hemoglobin A1c (HbA1c) test in past year	82.5	87.9	78.4	84.6
	Poor blood sugar control (HbA1c >9)**	33.4	23.4	42.5	32.0
	Lipid profile in past year	80.5	91.1	76.5	88.4
	Cholesterol control (LDL<130)	50.9	67.7	44.3	60.4
	Cholesterol control (LDL<100)	NA	41.9	NA	34.7
	Screening for kidney disease in past year	45.0	53.6	41.4	48.2
Antidepressant medication management*** (ages 18+)	Effective acute phase treatment	51.3	53.3	56.9	60.7
	Effective continuation phase treatment	36.8	39.2	40.1	44.1
	Optimal practitioner contacts	11.9	10.5	19.8	20.3
Hospitalization for mental illness (ages 6+)	Follow-up within 7 days	37.5	38.8	48.2	54.4
	Follow-up within 30 days	59.3	60.3	71.2	74.4
Patient experience (adults)	Rated health plan highly (8-10 on 10-point scale)	78.8	72.0	59.3	61.8
	No problem with customer service	80.3	79.9	66.6	70.8
	No problem getting needed care	85.0	84.1	75.4	78.4

Source: National Committee for Quality Assurance, *The State of Health Care Quality: 2004*. Adapted with permission.

*These data may not be comparable to the data in Table 1 because of differences in measures and data sources.

**A lower rate represents better performance for this measure.

***The first year shown for antidepressant medication management is 2001, not 2000.

LDL = low-density lipoprotein. See the Technical Appendix for other notes on HEDIS.

Technical Appendix

This appendix provides more information on data sources and study methodologies. Quality measurement sets and national data sources are described first, followed by notes on specific charts and studies. Study populations (denominators) are defined for each chart. Numerators are described for selected charts to clarify information displayed in the chart. The chartbook presents data from many different kinds of sources and studies conducted by different researchers using potentially different methodologies. Therefore, data may not be comparable between charts. Each type of data source has strengths and limitations for quality measurement. Differences described as statistically significant reflect a 95 percent confidence level or greater.

Quality Measurement Sets and National Data Sources Used in the Chartbook

The **Access to Care for the Elderly Project (ACE-PRO) indicators** measure underuse of necessary care that is “likely to be associated with avoidable poor outcomes” (Asch et al. 2000). Researchers at RAND, a nonprofit research institute, reviewed evidence and expert opinion to develop proposed indicators of necessary care for which: “(1) the benefits of the care outweigh the risks..., (2) the benefits to the patient are likely and substantial, and (3) physicians have judged that not recommending the care would be improper.” A multispecialty expert physician panel accepted 40 indicators representing 15 common acute and chronic medical

conditions. For more information, see: <http://jama.ama-assn.org/cgi/content/full/284/18/2325>.

The **Assessing Care of Vulnerable Elders (ACOVE)** quality measurement system focuses on 22 health conditions, selected through an expert ranking process based on prevalence, impact, effectiveness, feasibility, quality gap, and geriatric focus (Sloss et al. 2000), that together represent “the most important conditions vulnerable elders encounter in all care venues” (Wenger et al. 2003). They fall into three broad categories: *General medical*: depression, diabetes, hearing impairment, heart failure, hypertension, ischemic heart disease, osteoarthritis, osteoporosis, pneumonia, stroke, and vision impairment. *Geriatric*: dementia, end-of-life care, falls or mobility disorders, malnutrition, pressure ulcers, and urinary incontinence. *Cross-cutting*: continuity of care, hospital care, medication use, pain management, and screening and prevention. Using systematic evidence reviews and expert judgment, researchers at RAND developed potential indicators to represent quality of care for these conditions, of which 236 were accepted as valid by two expert panels and the American College of Physicians Task Force on Aging. For more information, see: www.rand.org/health/tools/vulnerable.elderly.html.

The **Agency for Healthcare Research and Quality (AHRQ) Quality Indicators** are designed to use hospital administrative data (billing records) to

“highlight potential quality concerns, identify areas that need further study and investigation, and track changes over time” (AHRQ 2003a). Researchers at the University of California San Francisco and Stanford University refined the indicators through a review of validity, reliability, and usefulness based on a literature review, empirical testing, and an expert clinician panel review. **Inpatient Quality Indicators (IQIs)** included in the chartbook represent conditions and procedures “for which mortality has been shown to vary substantially across institutions and for which evidence suggests that high mortality may be associated with deficiencies in the quality of care” (AHRQ 2002a). **Prevention Quality Indicators (PQIs)** “identify hospital admissions that evidence suggests could have been avoided, at least in part, through high-quality outpatient care” (AHRQ 2002b). **Patient Safety Indicators (PSIs)** identify potentially preventable complications of care and adverse events in the hospital. In empirical testing against medical records, PSIs were more likely to identify process of care failures than a random sample of control cases (AHRQ 2003b). For more information, see: www.qualityindicators.ahrq.gov.

The **Behavioral Risk Factor Surveillance System (BRFSS)** is a continuous, cross-sectional telephone survey of the civilian, noninstitutionalized adult population conducted in cooperation between the Centers for Disease Control and Prevention (CDC) and health departments in the 50 states,

the District of Columbia, Puerto Rico, Guam, and the Virgin Islands. Rates are weighted to be representative of the adult population in each state or territory. The 2002 BRFSS included 247,964 respondents (response rate 58 percent), of whom 51,082 were ages 65 and older (CDC 2003b). The 2003 BRFSS included 266,346 respondents (response rate 53 percent), among whom 56,547 were ages 65 and older (CDC 2004a). For more information, see: www.cdc.gov/brfss.

CAHPS (Consumer Assessment of Health Plans and Providers Study) is “a comprehensive and evolving family of surveys that ask consumers and patients to evaluate...those aspects of care for which consumers and patients are the best and/or only source of information” (SUN 2004). CAHPS was originally developed by researchers at Harvard, RAND, and the Research Triangle Institute for the Agency for Healthcare Research and Quality. The Centers for Medicare and Medicaid Services administers a Medicare version of CAHPS annually (in English and Spanish) to those who have been enrolled in Medicare for at least six months. A self-administered survey is sent by mail with follow-up of nonrespondents by telephone or special delivery. Medicare managed care members are randomly sampled at the plan level (N=128,000 in 2003; response rate 81 percent). Medicare fee-for-service beneficiaries are randomly sampled at the county level (N=122,000 in 2003; response rate 70 percent) (Goldstein et al. 2001; RTI 2001; Landon et al. 2004; personal communication with Elizabeth Goldstein 2005). For more information, see: www.cms.hhs.gov/researchers/projects/consumers/cahps.asp.

The Commonwealth Fund (CMWF) Health Insurance Survey is a biennial, cross-sectional telephone survey of U.S. civilian,

noninstitutionalized adults ages 19 and older. Results are weighted to be nationally representative. The content of the survey focuses on topics of current interest. The 2001 survey (the source for Chart 4:1) included 2,829 adults ages 19–64 and 628 adults ages 65 and older. The overall response rate was 54 percent (Davis et al. 2002). For more information, see: www.cmwf.org/surveys/surveys.htm.

The Community Tracking Study (CTS) Household Survey, conducted by the nonprofit Center for Studying Health System Change, is a periodic, nationally representative, cross-sectional telephone survey of the civilian, noninstitutionalized population. In-person interviews are conducted with households without telephones to ensure representation. The survey sample consisted of 47,000 to 60,000 individuals depending on the year, with response rates of 57 to 65 percent. The **CTS Physician Survey** is a biannual telephone survey of physicians in 60 randomly selected metropolitan areas. The survey includes physicians who report providing at least 20 hours of direct patient care in an office- or hospital-based practice. The response rate among physicians in the 2000–2001 survey was 59 percent. For more information, see: www.hschange.org/index.cgi?data=12.

The Healthcare Cost and Utilization Project (HCUP) is a collaboration between state and private data organizations, hospital associations, and the federal Agency for Healthcare Research and Quality “to create a national information resource of discharge-level health care data” (AHRQ 2005b). The 2001 **HCUP Nationwide Inpatient Sample** contains over seven million inpatient discharges from 986 hospitals located in 33

states, approximating a 20 percent stratified sample of U.S. community hospitals. Results are weighted to give national estimates. The 2001 **HCUP Statewide Inpatient Database** includes all discharges from hospitals in 33 participating states, representing approximately 85 percent of all U.S. hospital discharges, totaling over 28 million inpatient discharge abstracts. For more information, see: www.ahrq.gov/data/hcup.

The Health Plan Employer Data and Information Set (HEDIS) is “a set of standardized performance measures designed to ensure that purchasers and consumers have the information they need to reliably compare the performance of managed health care plans” (NCQA 2005). HEDIS was developed by the National Committee for Quality Assurance (NCQA), a nonprofit accreditation and quality-monitoring organization. NCQA collects Medicare HEDIS data on behalf of the Centers for Medicare and Medicaid Services (CMS) from all Medicare managed care plans that CMS requires to report HEDIS data. HEDIS data on employer-sponsored health plans represent 262 commercial organizations that submitted results to NCQA. HEDIS uses data from member surveys, administrative claims, and medical records. Results are audited according to NCQA’s standards (NCQA 2004). For more information, see: www.ncqa.org.

The Health and Retirement Study (HRS) is a nationally representative, longitudinal survey of community-dwelling adults conducted by the University of Michigan, Ann Arbor, for the National Institute on Aging. The first cohort represents individuals born between 1931 and 1941, and their spouses regardless of age. In 1992, baseline home interviews

were conducted in English and Spanish with 9,825 individuals in 7,702 households in the continental United States (response rate 82 percent). Follow-up interviews with this cohort have been conducted biennially. For more information, see: <http://hrsonline.isr.umich.edu>.

The **Medical Expenditure Panel Survey (MEPS)**, sponsored by the federal Agency for Healthcare Research and Quality (AHRQ), “produces nationally representative estimates of health care use, expenditures, sources of payment, insurance coverage, and quality of care for the U.S. civilian, non-institutionalized population” (NCHS 2004a). The core survey, called the Household Component (HC), consists of a series of interviews with a subsample of participants in the **National Health Interview Survey**. The 1996, 1998, and 2000 samples included 10,000 families and the 2001 sample included 13,500 families, with response rates of about 66 percent for full-year participation. For more information, see: www.meeps.ahrq.gov.

The **Medicare Current Beneficiary Survey (MCBS)** is a continuous, longitudinal survey of a representative national sample of the Medicare population, conducted by the federal Centers for Medicare and Medicaid Services. Each survey participant is interviewed three times per year for four years. About 15 percent of community-dwelling respondents designate a proxy to answer for them. Personal interviews are conducted with 15,000 to 19,000 respondents in each round, with response rates “in the mid to high 80s” for the initial interview and about 95 percent in subsequent rounds (NCHS 2004a; CMS 2004a). The **MCBS Access to Care File** combines survey data with Medicare administrative data to represent insurance coverage, health status and functioning,

access to care, information needs, satisfaction with care, and income. The sample represents beneficiaries who were enrolled in the Medicare program for the entire year. (Some reports using this data have been adjusted to represent Medicare beneficiaries enrolled at any time during the year.) The **MCBS Cost and Use File** includes complete expenditure and source of payment data on all health care services received by Medicare beneficiaries, including those not covered by the Medicare program. This data is derived from linked survey and Medicare claims data. The file also includes most items from the Access to Care file. The sample represents all beneficiaries who were enrolled in the Medicare program at any time during the year. For more information, see: www.cms.hhs.gov/mcbs/Overview.asp.

Medicare administrative data, maintained by the Centers for Medicare and Medicaid Services, include enrollment data for all Medicare beneficiaries and claims data on covered services paid for by the traditional Medicare program (NCHS 2004a). The **Medicare Provider Analysis and Review (MedPAR)** files contain information on hospital inpatient stays by Medicare fee-for-service beneficiaries. For more information, see: www.cms.hhs.gov/data/default.asp.

The **Medicare Patient Safety Monitoring System (MPSMS)** is “a nationwide surveillance project aimed at identifying the rates of specific adverse events within the Medicare population” (Hunt et al. 2004). The MPSMS was created by the Centers for Medicare and Medicaid Services in consultation with other federal agencies. Data are drawn from a national random sample of medical records for all Medicare hospital discharges (stratified

by state) and from Medicare administrative data for post-discharge surveillance (such as hospital readmissions). Medical record abstraction emphasizes transparency and reliability using explicit clinical criteria. For more information, see: www.qualidigm.org/what_con_patientSafety.shtml.

The **Medicare Quality Improvement Organization (QIO) program** uses quality measures derived from professionally developed practice guidelines to assess the quality of care received by Medicare fee-for-service beneficiaries. During 1998–2001, measurement focused on six common conditions “for which there is strong scientific evidence and professional consensus that the process of care either directly improves outcomes or is a necessary step in a chain of care that does so” (Jencks et al. 2003). Inpatient data were abstracted (at two central abstraction centers) from medical records for systematic random samples of hospital discharges identified from Medicare hospital claims. Sample sizes ranged from 600 to 900 records for each condition (acute myocardial infarction, heart failure, pneumonia, and stroke/atrial fibrillation) in each state. Median interrater reliability for medical record abstraction was 90 percent. Diabetes care and mammography rates were calculated using outpatient Medicare claims for services. Immunization rates were derived from the **BRFSS** or a special survey designed to emulate the BRFSS, representing all community-dwelling elderly. See Appendix Table 1a for a list of the quality indicators used during 1998–2001. For more information, see: www.medqic.org.

The **National Ambulatory Medical Care Survey (NAMCS)**, conducted by the National Center for Health Statistics, is a nationally representative survey of nonfederal, office-based physicians

who are primarily engaged in direct patient care. The specialties of anesthesiology, pathology, and radiology are excluded. Participating physicians complete an encounter form for each patient visit during a randomly selected week, listing new or ongoing diagnoses and prescribed medications. In recent years, about 1,000 to 1,500 physicians have participated, representing a response rate of 63 to 71 percent (NCHS 2004a). For more information, see: www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm.

The **National Health Interview Survey (NHIS)** is a continuous, cross-sectional, nationally representative household interview survey of the civilian, noninstitutionalized population of the United States, conducted by the National Center for Health Statistics (NCHS). In recent years, about 30,000 adults have participated in the core survey, which has achieved household response rates ranging from 90 to 98 percent. Supplements are conducted on selected topics, such as cancer screening, in selected years. Response rates for survey supplements have ranged from 70 to 80 percent (NCHS 2004a). For more information, see: www.cdc.gov/nchs/nhis.htm.

The **National Health and Nutrition Examination Survey (NHANES)** is a nationally representative, cross-sectional survey of civilian, noninstitutionalized Americans. Trained interviewers survey participants at home and participants attend a mobile examination center (MEC) to undergo medical examination and provide blood, urine, and other tissue samples for laboratory analysis following standard protocols. Those who cannot attend the MEC are examined at home. An average of three blood pressure readings are taken for each survey

participant during the home interview and physical examination. NHANES III (1988–1994) selected 39,695 persons of whom 78 percent participated in the medical examination. NHANES 1999–2000 selected 12,160 persons of whom 76 percent participated in the medical examination (NCHS 2004a). For more information, see: <http://www.cdc.gov/nchs/nhanes.htm>.

The **National Hospital Ambulatory Medical Care Survey (NHAMCS)**, conducted by the National Center for Health Statistics, is a nationally representative survey of visits to emergency departments (EDs) and outpatient departments (OPDs) of nonfederal, acute-care hospitals in the United States. Hospital staff complete encounter forms for a systematic random sample of patient visits during a randomly selected four-week period. About 500 hospitals participate each year, of which about 80 percent have EDs and about 50 percent have OPDs. Response rates ranged from 93 to 97 percent for EDs and 86 to 95 percent for OPDs in recent years. Data are weighted to represent national estimates (NCHS 2004a). For more information, see: www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm.

The **Outcome and Assessment Information Set (OASIS)** is “a group of data elements that represent core items of a comprehensive assessment for an adult home care patient; these core items and a comprehensive assessment serve as the basis for the development of the care plan and ongoing management of the patient; and form the basis for measuring patient outcomes for purposes of outcome-based quality improvement...Skilled home health staff gather the information by observing the patient and the patient’s home and situation, and by talking with the patient and caregivers” (CMS

2005a). Research on interrater reliability suggests substantial to excellent agreement on standardized patient assessments by different clinicians (Sangl et al. 2005). The federal government requires that all Medicare-certified home health agencies collect and report OASIS data for adult, nonmaternity patients whose skilled care is paid for by Medicare or Medicaid. For more information, see: www.cms.hhs.gov/oasis/hhview.asp.

Notes on specific charts

Acronyms in bold refer to the quality measurement sets and national data sources described above. Terms in italics refer to chart labels.

Chart 1:1—National data are from the **NHIS** (questions about vaccination were not asked in certain years) (NCHS 2004a, fig. 10). The reference population is U.S. civilian, noninstitutionalized adults ages 65 and older. National rates were age-adjusted to the 2000 U.S. standard population using two age groups: ages 65–74 and ages 75 and older.

State data are from the 2003 **BRFSS** (CDC 2004a, table 1). The reference population is U.S. civilian, noninstitutionalized adults ages 65 and older. Those with unknown vaccination status were excluded from state rates. Adult vaccination rates measured by the BRFSS tend to be somewhat higher than those measured by the NHIS, probably because of differences in question wording (Nelson et al. 2003). In state quartile rankings for pneumococcal vaccination, Florida and Connecticut were both placed in the second quartile because they have the same rate; one of the two states would have been placed in the third quartile based on ordinal ranking. Hawaii’s pneumococcal vaccination rate was 69.4 percent in 2003, not 44.5 percent as reported in

the source (personal communication with Judy Strait-Jones, Hawaii Department of Health, 2005).

Chart 1:2—National data are from supplements to the NHIS in certain years (NCHS 2004a, table 81). The reference population is U.S. civilian, noninstitutionalized female adults of specified ages. The question regarding mammography varied slightly across NHIS survey years. “Data starting in 1997 are not strictly comparable with data for earlier years due to the 1997 questionnaire redesign” (NCHS 2004a).

State data are from the 2002 BRFSS (CDC/MIAH 2004, table 3). The reference population is U.S. civilian, noninstitutionalized female adults ages 65 and older. In 2002, the BRFSS median mammography rate for women ages 65 and older was 77 percent across 54 reporting units. The same rate was reported on the 2000 BRFSS across 52 reporting units (www.cdc.gov/brfss). In contrast, a rate of 68 percent was reported on the 2000 NHIS for women ages 65 and older.

Chart 1:3—National data are from the 2000 NHIS cancer control module (Seeff et al. 2004, table 1). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. For national rates, those with a history of colorectal cancer were excluded from the analysis. Respondents who received a home fecal occult blood test (FOBT) as part of a routine physical exam/screening or because of a family history of cancer were counted as having received FOBT for screening purposes. Respondents who had ever received sigmoidoscopy, colonoscopy, or proctoscopy were asked about the timing of the most recent test.

State data are from the 2002 BRFSS (CDC/MIAH 2004; table 3). The reference population

is U.S. civilian, noninstitutionalized adults ages 65 and older. For state quartile rankings, Arizona, California, and Vermont were all placed in the second quartile because they all have the same rate; one of the three states would have been placed in the first quartile based on ordinal ranking. The BRFSS national median rate for ever receiving a sigmoidoscopy or colonoscopy was 58 percent among those ages 65 and older in 2002, as measured across 54 BRFSS reporting units (www.cdc.gov/brfss).

Chart 1:4—Data are from the 2000 MCBS Access to Care File (Adler and Shatto 2002, fig. 1, 2). The reference population is community-dwelling, female Medicare beneficiaries ages 65 and older.

Chart 1:5—The ACOVE-2 study included 644 community-dwelling patients ages 75 and older who were being treated at one of two California medical groups. Patients were included in this study if they screened positive for falls or fear of falling, urinary incontinence, or memory impairment. One practice focused on serving managed care patients while the other served a mix of managed care and fee-for-service patients. Baseline data shown in the chart were collected from medical records from Sept. 2000 through Sept. 2001 at one site and from Dec. 2000 through Dec. 2001 at the second site, before the intervention phase of the study (Reuben et al. 2003b; Wenger et al. 2005). The quality of care represented in the ACOVE study might be better than average care in the United States, given that the participating practices were large groups, participate in managed care and are therefore subject to ambulatory care quality audits, and have a history of participating with academic researchers in quality

assessment and improvement studies (personal communication with Paul Shekelle 2005).

Chart 1:6—Data are from the NAMCS and NHAMCS for 1997 and 1998 (combined) and 2000 and 2001 (combined) (AHRQ 2005b, table 1.91). The measure is derived from Healthy People 2010, indicator 14-19 (DHHS 2002b). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. The numerator is the number of antibiotic courses ordered, supplied, administered, or continued at a specific visit for persons diagnosed with the common cold.

Chart 1:7—Data are from the Medicare QIO program for 2002 (AHRQ 2005b, tables 1.85a, 1.86a, 1.87a). The reference population is Medicare fee-for-service beneficiaries discharged from the hospital with a principal diagnosis of pneumonia. *Blood cultures collected before antibiotics given* refers to pneumonia patients for whom blood cultures were ordered, among whom the blood culture was collected before the date and time that the initial antibiotic dose was administered. *Antibiotic given within 4 hours of hospital arrival* refers to pneumonia patients who received any antibiotic within four hours of hospital presentation. *Antibiotic was consistent with guidelines* refers to immunocompetent pneumonia patients who received an initial antibiotic regimen consistent with current professional guidelines (for intensive care or non-intensive care patients) during the first 24 hours of their hospitalization (Jencks et al. 2000).

Chart 1:8—Data are from the Medicare QIO program for 2002 (AHRQ 2005b, tables 1.36a, 1.37a, 1.38a, 1.39a, 1.40a). The reference population is Medicare fee-for-service beneficiaries discharged from the hospital with a principal diagnosis of

acute myocardial infarction and no documented contraindications to the particular treatment or other documented reason for not prescribing the drug. The study authors noted that, “we know from...field experience with the measures that valid, unmeasured contraindications are not frequent” (Jencks et al. 2000). The ACE inhibitor measure is limited to those with documented left ventricular systolic dysfunction (left ventricular ejection fraction less than 40 percent or narrative description of left ventricular function indicating moderate or severe systolic dysfunction). This measure did not account for the substitution of angiotensin receptor blockers (ARBs), which may add up to 10 percentage points to the rate (Masoudi et al. 2004) and will be counted for compliance in future years (personal communication with Edwin Huff 2005).

Chart 1:9—Data are from the **Medicare QIO program** for 2000–2001 (Jencks et al. 2003, table 2). The reference population is Medicare fee-for-service beneficiaries discharged from the hospital with a principal diagnosis of acute myocardial infarction, with documentation of ST-segment elevation myocardial infarction or left bundle branch block on the interpretation of the 12-lead ECG done closest to hospital arrival, and who received reperfusion. The PTCA measure excludes those who received thrombolysis during the hospital stay (CMS 2003; AHRQ 2005b). The study authors noted that results for specific states must be interpreted with caution because of small sample sizes in some states; hence, rates are not identified for specific states on the chart. However, “the effect of small denominators is to increase the variation among the states, not to bias the median downward” (Jencks et al. 2000).

Chart 1:10—Rates were calculated by the Medicare Payment Advisory Commission, applying the **AHRQ Inpatient Quality Indicators** (AHRQ 2002a) to all hospital claims in the **MedPAR** file for specified years (MedPAC 2004c, table 2-2). The reference population is Medicare fee-for-service beneficiaries discharged from the hospital with a principal diagnosis for the selected condition or with a procedure code for the selected procedure. The 30-day mortality rate was measured from hospital admission. Mortality rates were adjusted for age, gender, and severity of illness using the all-patient refined diagnosis-related groups (APR-DRGs) to control for changes in these characteristics of the patient population.

Chart 1:11—Rates were calculated by the Medicare Payment Advisory Commission, applying the **AHRQ Prevention Quality Indicators** (AHRQ 2002b) to all hospital claims in the **MedPAR** file for specified years (MedPAC 2004c, table 2-5). The reference population is Medicare fee-for-service beneficiaries. Admissions were identified based on principal diagnosis codes for the selected conditions, except that admissions for lower extremity amputation were identified from a relevant procedure code in any field with a diagnosis of diabetes in any field (AHRQ 2002b). Hospitalization rates were adjusted for age and sex to control for changes in these characteristics of the patient population. The analysis excluded beneficiaries admitted to the hospital from other hospitals or long-term-care facilities; however, MedPAC notes that “the reliability of admission source is somewhat questionable.” The cost-savings calculation described in the narrative was adapted from an example constructed by Kruzikas et al. (2004), substituting the number

of Medicare hospital admissions for these conditions as reported by MedPAC (2004c).

Chart 1:12—Data for blood pressure awareness are from the 1998 **NHIS** (AHRQ 2005b, table 1.33). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. Data for high blood pressure control are from **NHANES III** and the 1999–2000 **NHANES** (AHRQ 2005b, table 1.46). The reference population is U.S. civilian, noninstitutionalized adults of specified ages with elevated blood pressure (average systolic pressure of at least 140 mmHg or average diastolic pressure of at least 90 mmHg) or who were taking antihypertension medication. The numerator represents those in the denominator whose average systolic blood pressure was lower than 140 mmHg and whose average diastolic blood pressure was lower than 90 mmHg.

Chart 1:13—Data are from **NHANES 1999–2000** (Ford et al. 2003, table 3). The reference population is U.S. civilian, noninstitutionalized adults of specified ages with total cholesterol concentration of 5.2 mmol/L (200 mg/dL) or greater, or who were taking cholesterol-lowering medication. Survey participants were considered to have their cholesterol controlled if their cholesterol concentration was less than 5.2 mmol/L (200 mg/dL), as determined from a blood test.

Chart 1:14—Data are from **HEDIS** for the 2000 and 2003 measurement years (NCQA 2004, 26, 31, 33). *Beta-blocker prescribed after heart attack* refers to adults ages 35 and older who received an outpatient prescription for a beta-blocker within seven days after being discharged alive from the hospital with a diagnosis of acute myocardial infarction (NQMC 2003d).

The specification changed in 2003 to include certain patients with complicating conditions who were excluded in previous years.

Cholesterol management after heart attack refers to adults ages 18 to 75 who were discharged alive in the prior year for an acute coronary event (hospitalization for acute myocardial infarction or coronary artery bypass graft, or performance of percutaneous transluminal coronary angioplasty in any setting) and who were enrolled continuously in the health plan (with no more than one gap) for one year after discharge. *Cholesterol screening* means that a low-density lipoprotein cholesterol (LDL-C) screening was performed between 60 and 365 days after the discharge. *Cholesterol control* means the patients had LDL-C levels less than 130 mg/dl (acceptable) or less than 100 mg/dl (optimal) measured between 60 and 365 days after the discharge. (Measurement is required 60 days or more after discharge because LDL-C decreases temporarily following reperfusion and revascularization.) (NQMC 2003e). The terms “acceptable” and “optimal” cholesterol control were chosen by the chartbook authors to simplify the chart labels; these terms were not derived from HEDIS.

High blood pressure controlled refers to adults ages 46 to 85 who had a diagnosis of hypertension or documentation of high blood pressure in their medical record, were enrolled continuously in the health plan (with no more than one gap) during the measurement year, and had systolic blood pressure lower than 140 mmHg and diastolic blood pressure lower than 90 mmHg on the most recently recorded blood pressure measurement. Patients with end-stage renal disease (ESRD) are excluded (NQMC 2003f).

Chart 1:15—Data are from the **NAMCS** for 1991 and 1992 (combined) and 1999 and 2000 (combined) (Fang et al. 2004, table 3). The reference population is U.S. civilian, noninstitutionalized adults with atrial fibrillation (AF) who visited community physicians. Encounter records identified new or continued oral anticoagulant medication (warfarin sodium, dicumarol, anisindione, and phenprocoumon) or aspirin that was ordered, supplied, or administered at a patient visit. The analysis excluded patient visits with diagnoses that might contraindicate the use of anticoagulant medication. The increasing trend in anticoagulant use was statistically significant only among patients ages 80 and older and those at high risk for stroke. AF patients were considered at high risk for stroke if they were older than age 75 or had a diagnosis of prior transient ischemic attack or stroke (excluding intracranial hemorrhages), valvular heart disease, hypertension, or congestive heart failure. The estimated number of physician visits for AF increased during the study period, from 2.9 million in 1991 to 4.5 million in 2000.

Chart 1:16—Data are from the **2001 MEPS Diabetes Care Survey**, a self-administered paper survey given to all **MEPS** participants identified as ever having had diabetes (AHRQ 2005b, tables 1.15a, 1.16a, 1.17a, 1.18a). The reference population is U.S. civilian, noninstitutionalized adults with diabetes. Measures were derived from the National Alliance for Diabetes Quality Improvement. Those who did not respond and those who answered “don’t know” were excluded from the analysis. For more information on measure specifications and survey question wording, see: www.qualitytools.ahrq.gov/qualityreport/browse/browse.aspx?id=5116.

Chart 1:17—This chart reports follow-up data collected from medical records and patient interviews for the **ACOVE-2** study (see Chart 1:5 for description of the study population). The interviews were conducted at the end of the intervention phase of the study (Apr. 2002 through Apr. 2003 at one site and July 2002 through July 2003 at the second site). Osteoarthritis was not a target condition for the intervention. The indicators relating to non-steroidal anti-inflammatory drugs (NSAIDs) were applied to all ACOVE-2 patients treated with NSAIDs, not only those with osteoarthritis (Wenger et al. 2005).

Chart 1:18—This chart reports baseline data collected from medical records for the **ACOVE-2** study (see Chart 1:5 for description of the study population). To meet the “targeted history” indicator, the medical record had to document at least two of the following elements: (1) characteristics of voiding, (2) ability to get to the toilet, (3) prior treatment of urinary incontinence, and (4) importance of the problem to the patient. To meet the “targeted physical exam” indicator, the medical record had to document a rectal exam for men or a pelvic exam for women (Wenger et al. 2005).

Chart 1:19—This chart reports baseline data from the **IMPACT** (Improving Mood: Promoting Access to Collaborative Treatment) study conducted in 18 clinics affiliated with eight health care organizations in five states (Unutzer et al. 2003, table 3). The organizations included two staff-model HMOs, two regions of a large group-model HMO, the Veterans Health Administration, two university-affiliated primary care systems, and one private practice physician group. Potential study participants were identified through referral from

primary care practitioners or clinic staff, self-referral, and screening at primary care facilities. Based on responses to a structured interview, patients were included if they were ages 60 and older, intended to use one of the study clinics as their usual source of care in the coming year, and met diagnostic criteria for current major depression or dysthymia (chronic depressed mood). Those with current drinking problems or a history of bipolar disorder or psychosis, or who were in psychiatric treatment, severely cognitively impaired, or at acute risk for suicide, were excluded. Participants were interviewed by trained lay interviewers to collect baseline information. Potentially effective recent depression treatment was defined as taking antidepressants for two or more months or receiving four or more psychotherapy or counseling sessions for depression within the past three months.

Chart 1:20—Data are from HEDIS for the 2000 or 2001 and 2003 measurement years (NCQA 2004, 23, 37). *Antidepressant medication management* refers to adults ages 18 and older who were diagnosed with a new episode of depression, treated with antidepressant medication, and enrolled continuously in the health plan (with one allowable gap) with pharmacy and mental health benefits during the 12 months encompassing the new episode of medication therapy. *Effective acute phase treatment* means the patient remained on an antidepressant during the 12 weeks after diagnosis (NQMC 2003a). *Effective continuation phase treatment* means the patient remained on an antidepressant continuously during the six months (180 days) after diagnosis (NQMC 2003b). *Optimal practitioner contacts* means at least three follow-up contacts for mental health

with a practitioner during the 12 weeks after diagnosis. At least two of the three contacts must have been face-to-face visits and at least one of these visits must have been with a prescribing practitioner (NQMC 2003c). *Follow-up after hospitalization for mental health* refers to discharges for health plan members ages six and older who were hospitalized for treatment of selected mental health disorders (depression, schizophrenia, attention deficit disorder, and personality disorders), who were enrolled continuously (without gaps) during the seven- or 30-day follow-up period, and who were seen on an ambulatory basis or were in day/night treatment with a mental health provider during the seven- or 30-day follow-up period after hospital discharge (NQMC 2003g, 2003h).

Chart 1:21—OASIS measures shown in the chart are those for which results were reported in 2002 (AHRQ 2005b, tables 1.111 to 1.118, 1.121) and 2004 (CMS 2005a). The reference population is adult, nonmaternity patients (ages 18 and older) of Medicare-certified home health agencies whose episode of care was paid for by Medicare or Medicaid. The denominator is episodes of care for these patients that began and ended in the survey year. Measures of improvement exclude episodes of care for patients already at the highest assessment level, since their outcomes cannot improve. The stabilization in bathing measure excludes episodes of care for patients already at the lowest assessment level, since their outcomes cannot worsen. The rates shown in the chart are observed rates. A 2005 analysis of 2002–2004 rates, conducted for the Centers for Medicare and Medicaid Services, showed that the difference between observed and risk-adjusted rates is small (less than 1 percent for all but

two measures, improvement in bathing and in ambulation/locomotion, which showed differences between observed and risk-adjusted rates slightly greater than 1 percent). Comparing changes between 2002 and 2004, observed rates reflect less improvement than do risk-adjusted rates for all but one measure (improvement in toileting) (personal communication with the Center for Health Services Research, University of Colorado, 2005).

Chart 1:22—Data are from the Medicare QIO program for 1998–1999 and 2000–2001 (Jencks et al. 2003, fig. 1, 2). The reference population is Medicare fee-for-service beneficiaries. See Appendix Table 1a for conditions and measures that were included in state rankings. The Medicare QIO program included 24 quality indicators but two indicators measuring time to reperfusion were excluded from the state rankings described in this chart. Relative improvement was defined as a reduction in the failure rate or quality gap. For each state, the study authors calculated “a median amount of absolute and relative improvement across the set of indicators in the state. [T]he median absolute and relative national improvement [is] the median of these state medians” (Jencks et al. 2003). State rankings were determined by calculating each state’s rank on each of the 22 quality indicators and then averaging each state’s rankings across the 22 quality indicators.

Chart 1:23—Participants in the ACOVE-1 study were randomly selected from community-dwelling patients ages 65 and older who were members of two managed care organizations in the United States (one in the Northeast and one in the Southwest) from July 1, 1998, to July 31, 1999, and who had four times the risk for functional decline or death over the next two years (compared to

other elders) based on self-report or proxy-reported responses to a brief 13-item telephone screening survey. Patients who could not speak English, who were not enrolled continuously in the managed care organization for at least 13 months, and who were receiving out-of-plan care or active treatment for malignancy (excluding non-melanoma skin cancer) were excluded from the study. The final study sample consisted of 372 vulnerable elders for whom medical records were available for abstraction. Telephone interviews were conducted with patients between Aug. and Oct. 2000 to determine processes of care that participants had received (for services not captured in medical records) and to collect demographic and functional status information (Wenger et al. 2003, tables 3, 4, and 5).

Chart 2:1—Data are from the **MPSMS** for 2002 (AHRQ 2005b, tables 2.26 to 2.36). The reference population is hospitalized Medicare fee-for-service beneficiaries at risk of certain adverse events, including complications after joint replacement, urinary tract infection or pneumonia after surgical procedures, pneumonia associated with use of a mechanical ventilator, infections associated with central venous catheters (CVCs), and bloodstream infections among all hospital patients. *Complications of joint replacement* include postoperative infections, postoperative pneumonia, postoperative urinary tract infection, postoperative deep vein thrombosis or pulmonary embolus, dislocation, wound complications other than infection, nerve injury, postoperative bleeding requiring four or more blood transfusions, cardiovascular complications, same side revision during the index hospital stay, return to the operating room for reasons other than same side revision during the index hospital stay, and death.

Postoperative pneumonia and ventilator-associated pneumonia events exclude patients admitted with tracheostomies. *CVC-associated mechanical adverse events* include allergic reaction, tamponade, perforation, pneumothorax, hematoma, shearing off of the catheter, air embolism, misplaced catheter, thrombosis/embolism, knotting of the pulmonary artery catheter, arrhythmia requiring treatment during insertion, bleeding, equipment malfunction, and pain. *Postoperative venous thromboembolic events* include pulmonary embolism or deep vein thrombosis occurring postoperatively during the hospital stay and readmission of surgical patients within 30 days for pulmonary embolism or deep vein thrombosis. For more information on measure specifications, see: www.qualitytools.ahrq.gov/qualityreport/browse/browse.aspx?id=5106.

Chart 2:2—Rates were calculated by the Medicare Payment Advisory Commission, applying **AHRQ Patient Safety Indicators** (AHRQ 2003b) to all hospital claims in the **MedPAR** file for specified years (MedPAC 2004c, table 2-4). Rates were adjusted by age, gender, age-gender interactions, comorbidities, and diagnosis-related group (DRG) clusters. The numerators are based on secondary diagnoses only, to exclude complications that were present on admission. The denominators are limited to Medicare fee-for-service beneficiaries most likely to be at risk for the complication, as described below for the 10 indicators shown in the chart:

(1) *Decubitus ulcer* per 10,000 discharges of length five or more days, excluding paralysis patients, patients admitted from long-term care facilities, neonates, obstetrical

admissions, and patients with diseases of the skin, subcutaneous tissue, and breast.

- (2) *Postoperative pulmonary embolism or deep vein thrombosis* per 10,000 surgical discharges, excluding patients admitted for deep vein thrombosis, obstetrics, and secondary procedure of plication of vena cava before or after surgery. Also excludes admissions specifically for such thromboemboli, such as cases from earlier admissions, from other hospitals, or from other settings.
- (3) *Postoperative sepsis* per 10,000 elective-surgery discharges of longer than three days, excluding patients admitted for infection, patients with cancer or immunocompromised states, and obstetric conditions.
- (4) *Postoperative respiratory failure* per 10,000 elective-surgery discharges, excluding patients with respiratory disease, circulatory disease, and obstetric conditions.
- (5) *Deaths per 10,000 admissions for low-mortality diagnosis-related groups (DRGs)* with less than 0.5 percent mortality (among all hospital patients, not only Medicare beneficiaries), excluding trauma, immunocompromised, and cancer patients.
- (6) *Postoperative wound dehiscence* (reclosure of postoperative disruption of abdominal wall) per 10,000 abdominopelvic surgery discharges, excluding obstetric conditions. Also excludes admissions specifically for such wound dehiscence, such as cases from earlier admissions or from other hospitals.
- (7) *Accidental puncture or laceration* during procedures per 10,000 discharges, excluding obstetric admissions. Also excludes admissions

specifically for such problems, such as cases from earlier admissions or from other hospitals.

- (8) *Infections due to medical care* (primarily related to intravenous lines and catheters) per 10,000 discharges, excluding immunocompromised patients, cancer patients, and neonates. Also excludes admissions specifically for such infections, such as cases from earlier admissions, from other hospitals, or from other settings.
- (9) *Postoperative hip fracture* per 10,000 surgical discharges, excluding obstetrical patients and patients susceptible to falling (i.e., patients with musculoskeletal disease; patients admitted for seizures, syncope, stroke, coma, cardiac arrest, poisoning, trauma, delirium, psychoses, and anoxic brain injury; and patients with metastatic cancer, lymphoid malignancy, bone malignancy, and self-inflicted injury).
- (10) *Postoperative physiologic and metabolic derangements* per 10,000 elective-surgery patients, excluding obstetric admissions and some serious disease (i.e., patients with diabetic coma and patients with renal failure who also were diagnosed with acute myocardial infarction, cardiac arrhythmia, cardiac arrest, shock, hemorrhage, or gastrointestinal hemorrhage).

These definitions are derived from those reported by the Agency for Healthcare Research and Quality (AHRQ 2005b).

Chart 2:3—Rates were calculated by the Agency for Healthcare Research and Quality, applying **AHRQ Patient Safety Indicators** (AHRQ 2003b) to the **HCUP Nationwide Inpatient Sample** for 2001 (AHRQ 2005b, tables 2.9, 2.11a, 2.16). The

numerators are based on secondary diagnoses only, to exclude complications that were present on admission. The denominators are limited to hospital inpatients most likely to be at risk for the complication, as described for Chart 2:2, above. Rates were adjusted by gender, comorbidities, and DRG clusters. The rates per 1,000 reported in the source were converted to rates per 10,000 to be consistent with data reported in Chart 2:2.

Chart 2:4—This baseline data from the National Surgical Infection Prevention Project evaluated the medical records of 34,133 Medicare inpatients undergoing cardiac, vascular, hip/knee, colon, or hysterectomy surgery at one of 2,965 acute care hospitals nationwide from Jan. 1 through Nov. 30, 2001 (Bratzler et al. 2005, tables 2, 3, 5). These surgical procedures were chosen based on their frequency in the Medicare population, the rates of surgical site infection, and consensus regarding antibiotic prophylaxis. Performance measures were developed by an expert panel based on a review of the literature (Bratzler and Houck 2004). The analysis excluded patient records documenting preoperative infection, antibiotic use prior to hospital admission, or more than 24 hours of preoperative antibiotic prophylaxis. Measures of antibiotic timing excluded cases that were missing documentation of relevant dates and times. Among those lacking documentation of surgical incision time, results were similar when surgical start time was used as a proxy for incision time. The measure of appropriate antibiotic excluded cases in which no antibiotic was given before surgery, intraoperatively, or within 24 hours of the end of surgery. This measure also excluded colon surgery and hysterectomy patients with a β -lactam allergy because there are no guidelines for appropriate antibiotic selection. All rates were

weighted to be nationally representative after adjusting for the state-specific sampling scheme.

Chart 2:5—Rates were calculated by the Agency for Healthcare Research and Quality, applying the 1997 Beers criteria (Beers 1997) and the 2001 Zhan expert panel criteria (Zhan et al. 2001) to the 1996, 1998, and 2000 **MEPS** (AHRQ 2004, table 2.22a; AHRQ 2005b, tables 2.37a, 2.37b). The **MEPS** Prescribed Medicines Database combines data from the household interview and a follow-back survey of pharmacy providers to confirm medications dispensed to survey participants. Beers criteria were limited to 33 drugs that should always be avoided regardless of dosage, frequency, or duration of treatment. The Zhan expert panel identified a subset of 11 drugs that should always be avoided in the elderly. The remaining 22 drugs were classified as rarely appropriate (8 drugs) or often misused (14 drugs). The reference population is all U.S. civilian, noninstitutionalized elderly adults. The number of individuals affected, described in the narrative, was calculated by the chartbook authors based on the U.S. Census count of 35 million resident elderly Americans in 2000 (www.census.gov).

Chart 2:6—This study included 30,397 elderly Medicare beneficiaries ages 65 and older who received ambulatory health care at a large multispecialty group practice in the New England area from July 1, 1999, to June 30, 2000 (Gurwitz et al. 2003). Approximately 90 percent were enrolled in Medicare managed care plans. Drug-related incidents were primarily detected using (a) reports from health care providers, (b) review of hospital discharge summaries, (c) review of emergency department notes, and (d) review of administrative incident reports concerning medication errors. An adverse drug event was defined as an injury

resulting from the use of a drug. Adverse drug events were considered preventable if they were caused by an error (i.e., prescription errors, dispensing errors, patient adherence errors, and monitoring errors). Monitoring errors included inadequate laboratory monitoring of drug therapies or a delayed or failed response to signs, symptoms, or laboratory evidence of drug toxicity. Some adverse events were associated with multiple errors at more than one stage of pharmaceutical care.

Chart 3:1—Data are unadjusted rates from the 2002 **NHIS** (NCHS 2004b, table 15). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. The survey questions asked: “During the past 12 months, was there any time when [person] needed medical care but did not get it because [person] could not afford it?” and “During the past 12 months has [person] delayed seeking medical care because of worry about the cost?” Both questions excluded dental care. Unknown responses were excluded from the denominators.

Chart 3:2—The 2001 Survey of Seniors was administered by mail and telephone to community-dwelling Medicare beneficiaries (ages 65 and older) living in eight U.S. states (Ill., Mich., N.Y., Pa., Calif., Colo., Ohio, Tex.). The elderly population of these states represents 42 percent of all U.S. adults ages 65 and older. Four of the eight states had established, state-funded pharmacy-assistance programs. The Centers for Medicare and Medicaid Services provided a 10 percent probability sample of community-dwelling Medicare beneficiaries ages 65 and older in each state, which included information about Medicaid coverage. The survey was administered in either English or Spanish and had a response rate of 55

percent after exclusions. Data in the chart refer to 10,416 respondents for whom information was available on drug coverage. Probability sampling weights were applied to the data to correct for unequal sampling across states and populations. All differences in the restriction of drug use between Medicare beneficiaries without prescription drug coverage and those with prescription drug coverage shown in the chart were significant (Kitchman et al. 2002, fig. 13; Safran et al. 2002, exhibit 4).

Chart 3:3—Rates were calculated by the Medicare Payment Advisory Commission, applying the **ACE-PRO** indicators to the **MCBS Cost and Use File** for 1996 through 1999 (MedPAC 2002a, table 2-3). The reference population is elderly Medicare fee-for-service beneficiaries ages 65 and older. “Some supplemental coverage” refers to individuals with at least six months of additional coverage in a year (i.e., employer-sponsored insurance, Medigap insurance, Medicaid). The analysis included 22 indicators that were applicable to at least 20 survey participants covered only by Medicare. The chart shows 10 of 11 indicators for which there was a statistically significant difference in the use of services between Medicare beneficiaries without supplemental coverage and those with some supplemental coverage (rates of annual physician visits also showed a difference but are not shown). The Medicare Payment Advisory Commission notes that “other factors, such as education or income, may be correlated with both the necessary care indicators and insurance status, and may therefore confound our results. Multivariate analysis might show a smaller impact from having additional coverage, but would not be likely to eliminate the effect” (MedPAC 2002a).

Chart 3:4—Data are unadjusted rates from the 1993, 1997, and 2002 **NHIS** (NCHS 1997a, table 1; 1997b, table 1; 2002, table 33; 2004c, table XIX). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. Data for 1993 were based on responses to the question: “Is there a particular person or place that [the survey subject] usually goes to when [subject] is sick or needs advice about [his/her] health?” Data for 1997 and 2002 were based on the question: “Is there a place that you usually go to when you are sick or need advice about your health?” Unknown responses were excluded from the denominators.

Chart 3:5—Data are from the 1996–1997 and 2003 **CTS Household Survey** (Trude and Ginsburg 2005, table 5). The reference population is U.S. civilian, noninstitutionalized adults of specified ages. Appointment waiting times of more than 90 days were excluded to remove the effects of potential standing appointments (personal communication with Sally Trude 2005). The change in waiting times from 1997 to 2003 for all physician visits and for specialist physician visits was statistically significant for both near-elderly and elderly patients. There was no statistically significant change in waiting times for primary care physician visits for a specific illness. Data on waiting times for checkup visits are not shown.

Chart 3:6—Rates were calculated by the Medicare Payment Advisory Commission from a 5 percent sample of the Medicare enrollee database (MedPAC 2004a, fig. 6-1, 6-2). The reference populations are all Medicare beneficiaries (left chart) and elderly Medicare fee-for-service beneficiaries ages 65 and older (right chart).

Chart 4:1—Data are from the 2001 **CMWF Health Insurance Survey**, conducted from Apr. 27 through July 29, 2001 (Davis et al. 2002, exhibit 2). “In the analyses, persons with more than one source of coverage were assigned hierarchically to the Medicare, Medicaid, employer, and individual insurance categories, so that Medicare beneficiaries with supplemental coverage such as Medicaid, retiree coverage, or Medigap coverage are categorized as being Medicare enrollees.” Most (91%) of those with private coverage were in employer-sponsored plans. In regression analysis controlling for health status, poverty, and other factors (not shown), elderly Medicare beneficiaries were significantly more likely to rate health insurance excellent and to report being very satisfied with overall quality of care, and were significantly less likely to report negative plan experiences and any access problems due to cost, as compared to nonelderly adults with employer-sponsored insurance.

Chart 4:2—Data are from the Medicare **CAHPS** survey for 2003 (CMS 2005c). The reference populations are Medicare fee-for-service beneficiaries and Medicare managed care plan members. Rates were case-mix adjusted.

Always got care when needed without long waits is a composite of four questions asking how often, in the last six months, respondents: 1) got help or advice they needed when they called the doctor’s office during regular office hours, 2) got treatment as soon as they wanted when they needed to be seen right away for an illness or injury, 3) got an appointment as soon as they wanted for regular or routine health care, and 4) waited only 15 minutes or less past their appointment time to see the person they went to see.

Had no problems getting needed care is a composite of four questions asking how often, in the last six months, respondents had any problems with: 1) finding a personal doctor or nurse, 2) getting a referral to a specialist that they wanted to see, 3) getting the care they and their doctor believed necessary, and 4) getting care approved by the health plan without delays.

Rated their health plan the best possible is based on a question asking respondents to rate all their experiences with their health plan, using a scale from 0 (worst possible plan) to 10 (best possible plan). *Rated their care the best possible* is based on a question asking respondents to rate the care they received in the last six months from all doctors and providers in their health plan, using a scale from 0 (worst possible care) to 10 (best possible care).

Said that doctors in their plan always communicated well is a composite of four questions asking how often, in the last six months, respondents’ doctors or other health providers: 1) listened carefully, 2) explained things in a way they could understand, 3) showed respect for what they had to say, and 4) spent enough time with them.

Chart 4:3—Data are from the 2001 **MEPS** Self-Administered Questionnaire (SAQ), which collects respondents’ perceptions of health care quality using questions from the **CAHPS** survey (AHRQ 2005b, tables 4.1a, 4.3a, 4.5a, 4.7a). The reference population is U.S. civilian, noninstitutionalized adults of specified ages who visited a doctor’s office in the past year (78 percent of those ages 45–64 and 88 percent of those ages 65 and older). Those who did not respond or who answered “don’t know” were excluded from the analysis.

Chart 4:4—The chartbook authors calculated rates reported in the left chart using summary statistics

published by CMS from the **MCBS Access to Care File** (CMS 2000a, table 7-1; 2004a, table 7-1). The reference population is community-dwelling, elderly Medicare beneficiaries ages 65 and older. The right chart presents results of a Government Accountability Office audit based on 420 calls to the 1-800-MEDICARE beneficiary help line operated by two contractors for the Centers for Medicare and Medicaid Services (CMS). Calls were randomly placed during July 2004 to match typical calling patterns for the help line. For each call, auditors asked one of six questions about the Medicare program that were preselected from among the 100 questions most frequently addressed by the help line. Answers were considered inaccurate if they did not provide “sufficient and complete” information to meet criteria developed from the Medicare Web site’s frequently asked questions section. In the six months previous to the audit, the call volume to the Medicare help line had more than tripled in response to changes brought about by passage of the Medicare Modernization Act of 2003 (GAO 2004a).

Charts 4:5 to 4:7—Data are from a mortality follow-back study of 1,578 adults who died of chronic illness in 2000 (Teno et al. 2004, table 3). Interviews were conducted with informants listed on death certificates, who were typically family members, or someone else whom the informant recommended as knowledgeable about the person’s death (response rate 65 percent). Most interviews were conducted between nine and 15 months after the patient died. Respondents were asked about the quality of health care at the last place the patient spent at least 48 hours. Those who died at home without any formal care (13 percent of study subjects) were excluded from the analysis. Data were weighted to be nationally representative.

After controlling for potentially confounding factors (decedent's age, years of education, sex, race, underlying cause of death, and the respondent's perceptions of whether death was unexpected and the decedent's functional status), ratings for pain control, emotional support, and treating patients with respect were significantly better for those who died at home with hospice care than for those who received all other types of care. Comparing home care, hospital care, and nursing home care to hospice care at home, ratings were significantly worse for four, six, and seven of the nine measures shown in the chart, respectively.

Chart 5:1—Rates were calculated by the Agency for Healthcare Research and Quality, applying **AHRQ Patient Safety Indicators** (AHRQ 2003b) to the **HCUP State Inpatient Database** for 2001 (AHRQ 2005a, tables 101a, 104a, 108a). Rates were adjusted by age, gender, age-gender interactions, comorbidities, and diagnosis-related group (DRG) clusters. The numerators are based on secondary diagnoses only, to exclude complications that were present on admission. The denominators are limited to hospital inpatients most likely to be at risk for the complication, as described for Chart 2:2, above. The rates per 1,000 reported in the source were converted to rates per 10,000 to be consistent with the data reported in Chart 2:2.

Charts 5:2 to 5:4—Data are from the 1998, 2000, and 2001 **NHIS** (AHRQ 2005a, tables 1a, 1b, 1c, 3a, 3b, 3c, 24a, 24b, 24c, 25a, 25b, 25c, 68a, 68b, 68c, 72a, 72b, 72c). The population categories are shown as reported in the source. Immunization rates were age-adjusted to the 2000 U.S. standard population following methods used to track Healthy People 2010 goals, which specify that NHIS data for the elderly cohort be

adjusted using two age groups: ages 65–74 and ages 75 and older (DHHS 2002b). For the other measures, rates by race/ethnicity and by income were drawn from unadjusted age-specific categories in the source; rates by type of insurance were not age-adjusted for sigmoidoscopy/colonoscopy, according to the source. Numbers were too small to report mammography rates for Asian Americans or any measure for Native Americans.

Chart 5:5—Data are from the **HRS** 1931–1941 birth cohort (McWilliams et al. 2003, table 2). Analysis was limited to a subset of 2,203 HRS participants who were ages 60 to 64 when interviewed in 1996 and who were interviewed again in 2000 when they were age-eligible for Medicare. Based on self-reported insurance status, 167 participants were classified as continuously uninsured before age 65 if they were uninsured in both 1994 and 1996. Likewise, 1,820 participants were classified as continuously insured before age 65 if they were insured in both 1994 and 1996. Differences in rates of screening between the continuously uninsured and continuously insured groups were significantly reduced after Medicare eligibility. There was no significant change in the difference in screening among those who were intermittently uninsured in 1994 or in 1996, but not in both years (not shown).

Chart 5:6—This chart displays data from two studies that analyzed **HEDIS** data applicable to 7,498,496 Medicare beneficiaries enrolled in 301 Medicare managed care plans for the reporting year 2000 (based on 1999 experience) (Virnig et al. 2002, exhibit 2; Virnig et al. 2004, tables 3, 4). Individual-level HEDIS records were linked with information on age, race, sex, and state and county of residence obtained from the Centers for Medicare and

Medicaid Services (CMS). Individuals were excluded if their HEDIS and CMS data could not be merged, if their race was classified as unknown or other, if there was no evidence of managed care enrollment, or if they were younger than 65 years of age in 1999. All measures were adjusted for age and sex using direct standardization methods. Persons of Native American race were not included in the analysis for some measures because their numbers were too small to report. Compared to rates of treatment among white patients, the following rates were significantly different: beta-blocker treatment among black patients; hemoglobin A1c testing among black and Asian patients; high blood pressure control among black patients; effective acute-phase antidepressant treatment among black and Asian patients; 30-day follow-up after hospitalization for mental illness among black patients.

Chart 5:7—Rates were calculated by the Medicare Payment Advisory Commission from a 5 percent sample of the Medicare enrollee database (MedPAC 2004a, fig. 6-3). The reference population is Medicare fee-for-service beneficiaries.

Chart 5:8—This study used data from the Medicare Denominator file and the **MedPAR** file to identify individuals who were enrolled in Medicare Part A and Part B for at least two years before their death and who had at least one nonsurgical hospital admission for one of 11 chronic conditions in the last two years of life. Each patient was assigned to the hospital that the patient most frequently used in the last two years of life; ties were decided in favor of the hospital discharge closest to the date of death. The final analysis included 90,616 patients who died in 1999–2000 and most frequently used one of 77 hospitals listed in *U.S. News and World*

Report's 2001 rankings of the best U.S. hospitals for geriatric care and for care of heart and pulmonary diseases. Utilization rates were adjusted to control for differences in patients' age, sex, race, and clinical comorbidities. To control for differences in the severity of illness, the analysis was restricted to care delivered in the last six months of life. Results focused on patient cohorts with solid tumor cancer, chronic obstructive pulmonary disease, or congestive heart failure. Following the principles of population-based epidemiology, utilization rates were based on "the total experience of the cohort, not just on services provided by the index hospital and associated providers. However, since the percentage of total hospital care provided by the index hospital is high, the variations in illness-adjusted use of care primarily reflect clinical choices made by physicians associated with that hospital" (Wennberg et al. 2004b, exhibit 2).

Chart 5:9—This study used states' overall rankings on 22 indicators of the quality of care, as measured by the **Medicare QIO program** for Medicare fee-for-service beneficiaries during 2000–2001. (See Appendix Table 1a for a list of the measures. The Medicare QIO program included 24 quality indicators but two indicators measuring time to reperfusion were excluded from the state rankings described in this chart.) Detailed risk adjustment has not been found critical when using such process-of-care measures for population-based analyses. Medicare fee-for-service claims data were used to calculate Medicare spending per beneficiary at the state level. Spending was adjusted for inflation, differences in state price levels, and the age, sex, and race of each state's Medicare population. The numbers of specialists, primary care physicians, and registered nurses were determined using data from the 2003 Area

Resource File summed across all counties in each state. Determinants of state spending and quality were examined using generalized least squares regression weighted by the size of the Medicare population in each state. Increased state spending was associated with statistically significant reductions in rates for 15 of the 24 QIO indicators; there was no significant effect for the other nine indicators. In a separate analysis, there was no correlation between changes in state-level Medicare spending per beneficiary and changes in rates of four quality measures from 1995 to 1999 (Baicker and Chandra 2004, exhibit 1).

Chart 5:10—This study involved a cross-sectional analysis of 150,391 patient visits for evaluation and management by 43,032 black and white Medicare beneficiaries ages 65 and older who were treated by 4,355 primary care physicians (family or general practice, general internal medicine, or geriatrics). Data on patient visits from the Medicare "5 percent carrier file" were linked with survey data for 77 percent of the physicians who participated in the 2000–2001 **CTS Physician Survey**. Results were weighted to be nationally representative. The unit of analysis was the patient visit; some patients saw more than one physician in the survey. Physicians who saw both black and white patients are represented in both counts of visits by black patients and visits by white patients. The majority of visits by both white and black patients were with white physicians, although black patients were more likely to visit black physicians. Differences in measures for physicians visited by black patients and physicians visited by white patients shown in the chart were statistically significant in both unadjusted and adjusted analyses. The adjusted analysis included measures of payer mix, median income within the ZIP code of the practice, and

availability of resources in the county in which the practice was located (Bach et al. 2004, table 2).

Chart 6:1—This before-and-after study evaluated the medical charts of patients hospitalized for pneumonia in the Louisiana State University Internal Medicine ward between July 2000 and June 2001 (pre-intervention) and July 2001 and June 2002 (post-intervention). A total of 435 hospitalizations were evaluated to determine the percentage of patients who were screened for or received pneumococcal vaccination. Measures were the same as those used in the **Medicare QIO program**. Patients who received nonacute care, transferred from another acute care facility, did not have pneumonia, or died while in the hospital were excluded from the analysis. There were no significant differences in patient demographics (age and sex) or length of stay between the pre- and post-intervention patients. All differences between the pre- and post-intervention groups shown in the chart were statistically significant. The educational intervention was implemented from July 2001 through June 2002. A questionnaire was administered to Internal Medicine house staff prior to and at the conclusion of the intervention to assess their understanding of the benefits and indications of pneumococcal vaccination. Statistically significant improvements in questionnaire scores were observed for all house staff combined (Kruspe et al. 2003, tables 2, 4, 5).

Chart 6:2—The Guidelines Applied in Practice (GAP) initiative of the American College of Cardiology was a comparative before-and-after study that included Medicare and non-Medicare patients treated for acute myocardial infarction (AMI) at 10 acute-care hospitals in southeastern Michigan. The chart is based on a subgroup

analysis of results for Medicare beneficiaries identified from Medicare claims data (N = 515 at baseline; N = 663 at follow-up). Baseline data were collected from a random sample of medical records for patients discharged from July 1998 to June 1999. Follow-up data were collected from medical records for all Medicare patients discharged from Sept. to Dec. 2000. Medical record abstraction was performed by a central center. The denominator for a quality indicator included only eligible patients who did not have a documented contraindication for the specific treatment. Follow-up rates shown in the chart, which represent a subset of patients for whom there was chart documentation of GAP-promoted tool use, were significantly greater than rates at follow-up for a control group of Medicare patients at 11 nonparticipating hospitals. Data for the control group were collected for a public profiling project among southeast Michigan hospitals from Jan. to Dec. 1998 at baseline (N = 513) and from Mar. to Aug. 2001 at follow-up (N = 388) (Mehta et al. 2002, table 4). For more information, see: www.acc.org/gap/mi/ami_gap.htm.

Chart 6:3—This randomized controlled trial included 239 eligible patients ages 65 and older who were admitted from their homes to one of six Philadelphia academic and community hospitals between Feb. 1997 and Jan. 2001 with a diagnosis of heart failure. To be included, patients had to speak English, be alert and oriented, be reachable by telephone after discharge, and reside within 60 miles of the hospital. Patients with end-stage renal disease were excluded because of their unique service needs. Research assistants blinded to study assignment interviewed patients in the hospital to obtain baseline information and conducted telephone interviews at two, six, 12, 26, and 52

weeks after discharge to collect information on resource use, functional status, quality of life, and patient satisfaction. Resource costs were estimated using standardized Medicare reimbursement rates; intervention costs were calculated based on clinicians' billable time devoted to intervention-related efforts. All differences between the intervention and control groups shown in the chart were statistically significant. In multivariate Cox proportional hazards analysis, the time to first rehospitalization or death was significantly longer for patients in the intervention group. Efficacy did not vary by hospital although the intervention effect decreased over time. Only short-term improvements were seen in quality of life and patient satisfaction (Naylor et al. 2004, tables 3, 4). For more information, see: www.nursing.upenn.edu/centers/hcgne/TransitionalCare.htm.

Chart 6:4—The IMPACT (Improving Mood: Promoting Access to Collaborative Treatment) study was a randomized controlled trial that enrolled 1,801 depressed individuals ages 60 and older who were treated at one of 18 primary care facilities in five states (see the entry for Chart 1:19 for information on study recruitment). Research assistants blinded to the study conditions conducted an in-person baseline interview and follow-up telephone interviews with patients at three, six, and 12 months to collect information regarding the severity of depressive symptoms, health-related functional impairment, overall quality of life in the past month, satisfaction with depression care, and use of antidepressant medications, counseling, or psychotherapy within the past three months. All measured differences between the intervention and control groups were statistically significant in adjusted regression analysis at three-, six-, and

12-month follow-up. The intervention effect increased over time but varied by organization (Unutzer et al. 2002, tables 3, 4). For more information, see: www.impact.ucla.edu.

Chart 6:5—The New York University Spouse-Caregiver Intervention Study was a randomized controlled trial that recruited subjects through the New York University Alzheimer's Disease Center, local chapters of the Alzheimer's Association, media announcement, and physician referrals. The patient or caregiver had to have at least one other relative living in the nearby area. A total of 406 spouse-caregivers (average age 71 years) were randomly assigned to receive either enhanced counseling and support treatment or usual care. Spouse-caregivers in the intervention group were more often wives (66% vs. 55%) and had lower depression scores. Following a comprehensive battery of questionnaires answered at baseline, caregivers were interviewed in person or by telephone every four months during the first year and every six months thereafter to assess caregiver depression status and patient dementia status. Caregiver depression was assessed using the Geriatric Depression Scale. Follow-up interviews were conducted until two years after the death of the patient or until caregivers refused or were no longer able to participate. The graphs represent predicted values of the depression scores, controlling for covariates, using random effects growth curve modeling. Caregivers' mean-centered baseline depression scores and gender were included as covariates in the model to equalize rates at baseline. The best-fitting longitudinal change pattern was selected for the first year (logarithmic model) and follow-up years (linear model) (Mittelman et al. 2004, fig. 1, 2). The median time before nursing home placement is a weighted

average of Kaplan-Meier survival estimates for men and women (Mittelman et al. 1996). For more information, see: <http://aging.med.nyu.edu/programs/clinicalresearch/adrc/psychosocial>.

Chart 6:6—This comparative before-and-after study included 157,548 patients admitted over three years to 54 Outcome-Based Quality Improvement (OBQI) agencies participating in the national demonstration trial in 27 states and 105,917 patients admitted over four years to 19 OBQI agencies participating in the New York State demonstration trial. The trials occurred from 1995 to 2000. OASIS data on 41 outcome measures were collected for each patient within the OBQI program at the start of care and every 60 days until discharge, when final data were collected. For each pre/post comparison shown in the chart, the first year is risk-adjusted (using logistic regression) and the second year is an observed rate. Risk models were revised for each annual reporting period. Rates differ between comparison periods because of risk-adjustment and differences in sample sizes (a few agencies were excluded in some years because of data reporting issues). The net decreases in rates between each year in the chart were statistically significant. The 22 percent relative decrease in hospitalization rate for the national demonstration (described in the narrative) reflects a risk-adjusted net decrease of 7.2 percentage points when Year 3 is compared to Year 1. The 26 percent relative decrease in the New York State demonstration reflects a risk-adjusted net decrease of 7.9 percentage points when Year 4 is compared to Year 1. A comparative analysis used Medicare claims data for a 5 percent random sample of home health patients in the same 27 states who were cared for by agencies that were not participating in the demonstration. This analysis found a decrease

in the hospitalization rate of 0.4 percent from Year 1 to Year 2 and a 0.3 percent decrease from Year 2 to Year 3 for the comparison patients (Shaughnessy et al. 2002a, fig. 3). For more information, see: <https://www2.uchsc.edu/chsr/center/meqa.shtml>.

Chart 6:7—The Program of All-Inclusive Care for the Elderly (PACE) was a federal demonstration project at the time of the analysis. Data for this comparison study came from interviews with PACE applicants conducted at the patients' homes between Jan. 1995 and Aug. 1997. The treatment group included those who decided to enroll in PACE and were accepted into one of 11 PACE demonstration sites prior to the follow-up interview. Those in the comparison group qualified for PACE but decided not to enroll in the program. Participants were excluded if they refused to participate in the baseline survey or had missing information, had missing information for the enrollment decision, or had missing information on the outcome of interest. PACE outcomes were measured during follow-up interviews at six months (N = 1,098), 12 months (N = 783), 18 months (N = 529), and 24 months (N = 296) following the baseline survey. Only the 12-month results are shown in the chart. All differences shown in the chart between the PACE group and the comparison group, except in health status, were statistically significant in regression analyses controlling for baseline characteristics (Chatterji et al. 1998, exhibit 14). For more information, see: www.npaonline.org.

Chart 6:8—This comparison study was conducted at the Kaiser Permanente (KP) TriCentral Service Area located in southern California. A subgroup analysis of 300 patients who died during the study from congestive heart failure, chronic obstructive

pulmonary disease, or cancer was performed; 161 patients were enrolled in the KP Palliative Care Project intervention. The comparison group included 139 patients who received usual Medicare home care. All patients had a life expectancy of less than 24 months. Palliative care patients could maintain their primary care physician while being treated at home by the palliative care physician. Pain was assessed at each home visit, and 24-hour telephone support was provided to palliative care patients. Data on resource use were obtained from the KP service utilization database. Research assistants blinded to the group assignments conducted telephone interviews with patients seven days after their enrollment in the study and every 60 days thereafter to obtain information regarding demographics, the severity of illness, and satisfaction with services. Satisfaction was measured using the Reid-Gundlach Satisfaction with Services instrument. Scores at 60 days post-enrollment were 43.55 and 40.97 for the intervention and usual care groups, respectively, as compared to 41.13 and 40.19 at baseline. The mean satisfaction score was significantly higher at 60 days post-enrollment only for the intervention group. For purposes of the chart, satisfaction scores were converted into a percentage by dividing them by the total possible score of 48. Costs of care (not shown) were calculated based on 1999 staff salary rates; medication, facility, and administrative costs were not included. Rates of service use were adjusted to control for days enrolled, congestive heart failure diagnosis, and severity of illness. All between-group differences in service use shown in the chart were statistically significant (Brumley et al. 2003b, fig. 1, 2, 3; personal communication with Susan Enguidanos 2005). For more information on this intervention, see: www.growthhouse.org/palliative.

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