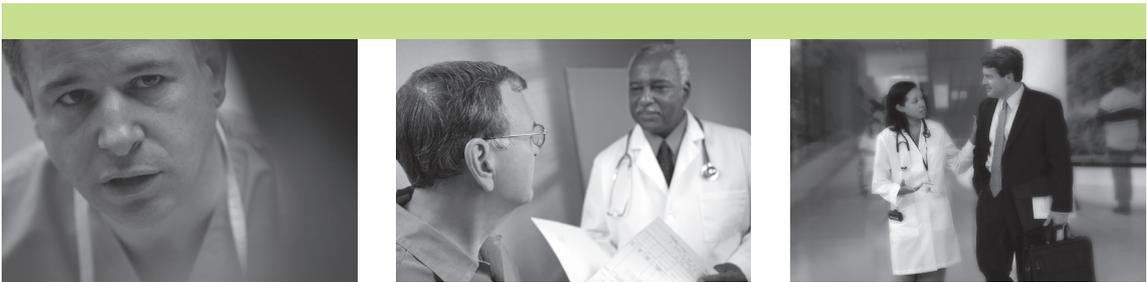


How Many More Studies Will It Take?



A Collection of Evidence That Our
Health Care System Can Do Better



New England Healthcare Institute



How Many More Studies Will It Take?

A Collection of Evidence That Our
Health Care System Can Do Better

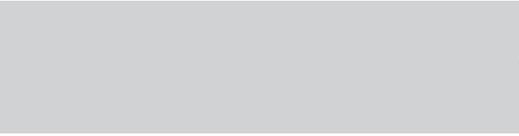
A Compendium of Evidence
from
1998-2006



New England Healthcare Institute

*Made possible by a grant from
Blue Cross and Blue Shield of Massachusetts, Inc.*





Introduction

About the New England Healthcare Institute

The New England Healthcare Institute (NEHI) is an independent, not-for-profit organization dedicated to transforming health care for the benefit of patients and their families. In partnership with members from all across the health care system, NEHI conducts evidence-based research and stimulates policy change to improve the quality and the value of health care. Together with this unparalleled network of committed health care leaders, NEHI brings an objective, collaborative and fresh voice to health policy. www.nehi.net.

The U.S. spends more money on health care than any other nation in the world. According to Medicare actuaries, the U.S. will spend nearly \$2.3 trillion on medical care in 2007, representing approximately 16.7 percent of the nation's GDP. If health care spending remains unchecked, these National Health Expenditures are expected to grow to 20 percent of GDP by 2015.¹

However, in spite of this significant investment in health care services, we lag behind other developed countries in the world on many important measures of our health status. Given the discrepancies between what we invest in health care and what we receive back in *health*, many experts believe that a large portion of our health care dollars are wasted, with estimates suggesting that up to 30 percent of total spending could be eliminated without reducing health care quality at all.² If these conservative estimates are correct, this equals an almost \$700 billion opportunity to improve the way we administer, manage, and deliver health care in the U.S. Realizing even a fraction of those savings would result in opportunities to redirect substantial funds to increase the quality of our health care and to provide access to care for every person in this country.

There is a compelling need to address waste for three reasons. First, the cost savings associated with eliminating waste are likely to be very large. Second, collaborative efforts to control waste could spur an emphasis on evidence-based practice that would lead to long-term quality improvement. Third, beyond

economic arguments, wasteful spending may actually decrease the quality of health care. Unnecessary procedures and medicines, for example, expose the population to significant health risks, complications and even death. In addition, waste associated with the failure to follow accepted treatment protocols not only costs money, but decreases productivity, reduces quality of life, and may cause serious harm to patients.

Although many policy experts and professional organizations have published well-regarded studies of specific areas of waste and inefficiency in clinical medicine, few have studied it from a system-wide perspective. As a result, opinions, rather than evidence-based solutions, have dominated the discussion to date. Until now there has not been a methodologically rigorous compilation of evidence on waste and inefficiency that stretches back more than a decade. Knowing where the waste is, why it exists and how many dollars are wasted are prerequisites for removing waste from the health care system.

Two important resources accompany this introductory summary:

- An annotated bibliography that was compiled by RAND researchers and published as an Appendix to the IOM report, *Crossing the Quality Chasm* (2001) and in *The Milbank Quarterly*. The IOM report examined studies published between January 1993 and July 1998, when the problems of overuse, underuse and misuse were poorly recognized and not accorded the importance they deserved.

-
- A compendium of methodologically reliable studies created by the New England Healthcare Institute (NEHI). Researchers created an annotated list of 460 studies that represents a unique evidence base of peer-reviewed studies that appeared in the literature from 1998 through March of 2006. That was a period when interest in the quality of care exploded following the conclusions of the IOM's National Roundtable on Health Care Quality that "serious and widespread" problems of overuse, underuse, and misuse are harming "very large numbers of Americans" throughout the country.

While arguments can be made for adding some studies and omitting others in each of these bibliographies, there can be no doubt that these carefully documented lists identify compelling research that challenges each sector of the health care system to confront the physical and financial harm of wasteful, inefficient, or poor-quality care.

Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care

We have tried to provide a common context for understanding waste in clinical care by defining it as *health care spending that can be eliminated without reducing the quality of care*. While many experts recognize the opportunities to reduce waste in the health care system, there is a significant gap between what we know and how we put that knowledge into action. The specific, clinically important examples of overuse, underuse, and misuse of health services that have been documented in the past 15 years are daunting, but they do provide us with a platform for serious change.

A. Misuse

“Misuse” refers to care that causes harm to a patient or involves preventable complications of any treatment. Adverse treatment events are well documented sources of waste. Studies from Harvard Medical School suggest that adverse events conservatively account for five percent of total health care spending or \$100 billion per year, and that almost half of all adverse events (46.5 percent) are avoidable.¹⁴

Evidence shows that over half of all adverse drug events occur in the non-hospital setting.¹⁵ Although ideas to address these errors are abundant, little has actually been done to solve the systemic causes that contribute to their existence, such as uncoordinated prescribing among physicians.

Hospital-acquired infections make up an additional set of avoidable costs. Between 5

and 10 percent of all patients admitted to acute care hospitals acquire one or more infections, resulting in an estimated 90,000 deaths each year and annual waste totaling an estimated \$4.5 to \$5.7 billion per year.¹⁶ A recent report from the Pennsylvania Health Care Cost Containment Council (PHC4) has suggested that the problem may be much larger. In 2004, hospitals in Pennsylvania reported 11,668 hospital acquired infections; of these, 15.4 percent of the patients who acquired an infection died. The direct medical cost associated with these infections in Pennsylvania was \$2 billion.¹⁷ If these findings are similar elsewhere, conventional estimates of the costs attributable to hospital-acquired infections are grossly understated.

Taken together, avoidable adverse treatment events and hospital-acquired infections conservatively result in a minimum of \$54.5 billion that are wasted each year, not to mention the human toll of these preventable events.

B. Overuse

“Overuse” occurs when a health care service is provided in which the potential for harm exceeds the possible benefit of the care. By far the largest source of wasteful spending is unexplained variation in patterns of care that are not associated with improvements in clinical outcomes. Many interventions vary dramatically among regions with no real explanation for the variation.³ The literature documents that the costs of the variation between high and low utilizing regions approaches 30 percent of **total** health care spending, or up

Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care

to \$690 billion.⁴ Much of the evidence comes from studies of Medicare populations, but data exist to demonstrate the same variation in non-Medicare populations as well.⁵

For instance, 40 percent of all Emergency Department (ED) visits are for non-emergent conditions and 31 percent of non-emergent visits occur during regular business hours.⁶ These visits are more expensive than comparable office visits. They result in higher volumes of more expensive testing and, in 5.5 percent of cases, potentially avoidable hospital admissions.⁷

More antibiotics are prescribed for acute respiratory infections than for any other illness. Otitis media (ear infection), pharyngitis (sore throat), and other upper respiratory infections account for approximately 75 percent of all ambulatory care prescriptions.⁸ Our analyses of the peer-reviewed literature showed that there is strong evidence that most of the antibiotics prescribed for the treatment of these infections are unnecessary, as these common infections are largely due to viruses that are not susceptible to antibiotics. Although simple and inexpensive point-of-service lab tests are available to identify the patients who truly need antibiotics, these tests are not widely used. The data suggest that up to 55 percent of antibiotic prescriptions are medically unnecessary and could be avoided, resulting in annual savings of \$1.1 billion.⁹

C. Underuse

“Underuse” is the failure to provide a health care service when it would have produced a favorable outcome for a patient. As the 1998 IOM National Quality Roundtable put it: “Underuse of proven effective interventions leads to major foregone opportunities to improve health and function.”

Just as overuse has an important economic component, so, too, does the underuse of services. According to a Kaiser Family Foundation research analysis, the uninsured receive less preventive care, are diagnosed at more advanced disease stages, and tend to receive less therapeutic care after diagnosis. The Foundation concluded that “having health insurance would reduce mortality rates for the uninsured by five to 15 percent.” Separately, the IOM concluded in 2004 that lack of health insurance causes roughly 18,000 unnecessary deaths in the United States every year.

There is a strong body of evidence to suggest that the underuse of generic antihypertensives is widespread and provides an opportunity to decrease costs.^{10, 11} Many hypertensive patients could be treated with inexpensive generic medications, such as diuretics and first-generation β -blockers, rather than the more expensive, branded antihypertensives that are typically prescribed. Our analyses of the evidence suggest that at least \$3 billion could be saved each year by simply making less expensive but equally effective medication choices.

Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care

Another important example of the underuse of appropriate medicines that is widely documented in the literature is the underuse of inhaled corticosteroids and other controller medicines in pediatric asthma. Evidence suggests that inhaled steroids and long-term controllers are underused by up to 60 percent of children with asthma, resulting in avoidable emergency visits and hospitalizations.¹² Regular use of inhaled steroids would reduce hospitalizations by 25 percent¹³ and could avoid direct medical costs totaling \$2.5 billion each year.

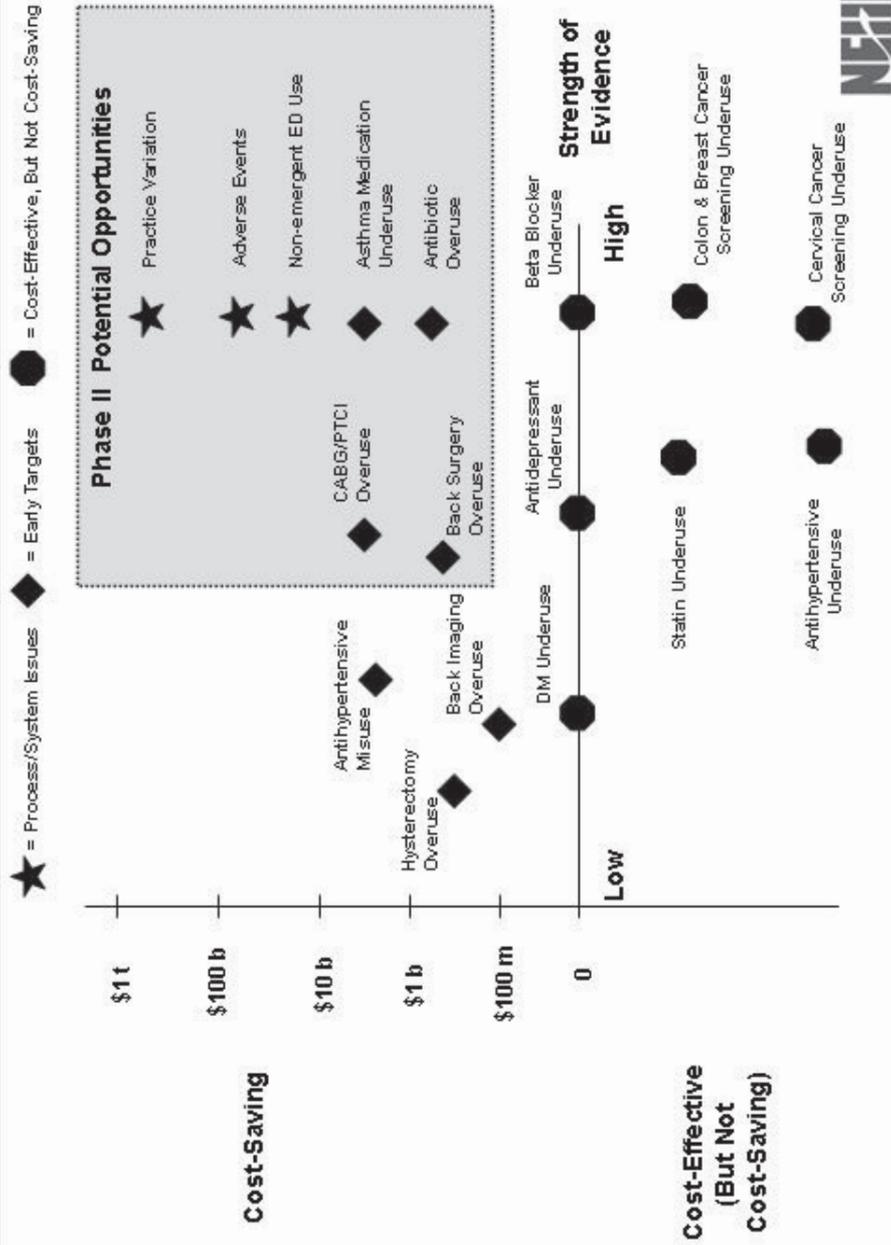


Five Broad Root Causes for the Sources of Waste in Clinical Care

The NEHI findings demonstrate the pervasiveness of waste and identify five broad root causes for the sources of waste in clinical care:

- **Variation in the Intensity of Clinical Care:** Data show that the magnitude of waste due to unexplained variation in intensity of medical services among geographic areas is significant, with estimates reaching as high as 30 percent of total health care spending. While the causes of unexplained variation are only partially understood, the preponderance of unexplained variation leading to waste results from uncertainty. This uncertainty in health care arises from two causes. First, human biology inherently varies in response to both disease and treatment. Second, much of what physicians do in their daily work is not grounded in evidence, but represents the art of medicine rather than the science. Clinical decision making evolves from “schools of thought” formed during residency training which persist throughout a physician’s career and which are slowly molded by individual clinical experience. In this way, local medical norms or cultures—“the way we do things around here”—form physician behavior, leading to regional variations in approaches to diagnoses and treatments. Determining optimal practices and disseminating them have proven difficult, and it is important that evidence point to “doing the right thing and doing it *right*.”
- **Lack of Compliance with Evidence-based Guidelines:** Uncertainty clearly contributes to waste, but even when we think we know the “right thing,” doing it consistently remains elusive. From our analyses, much of the waste in clinical care results from failure to comply with established and accepted clinical practices. To many in the health care community, guidelines exemplify the scientific method whereby one adopts a process, measures the result, and then modifies the process—the cycle of continuous quality improvement. Guidelines, however, are not viewed favorably by all. They often disrupt existing practice patterns, and they threaten physician autonomy. Most importantly, perhaps, they are simply not available at the moment decisions are made.
- **Limited Adoption of Clinical Information Technologies:** Decision support systems available at the point of care, where clinical decisions are actually made, are available but not broadly adopted. In addition to facilitating guideline compliance, these technologies are proven to decrease adverse effects of treatment, such as drug errors and wrong-site surgeries, that are major drivers of avoidable waste in health care. Information technology offers a chance to dramatically decrease these events through expert decision support, drug tracking, and electronic order entry. Electronic medical record keeping and e-prescribing technologies exist today and can play an important role in reducing waste in clinical care.
- **Failure of Primary Care Systems to Provide Timely Access:** Evidence indicates that avoidable emergency department (ED) care, avoidable hospital admissions from

Waste Phase I Findings



Five Broad Root Causes for the Sources of Waste in Clinical Care

the ED, and inappropriate intensity of ED services may stem from a lack of access to appropriate levels of primary care.¹⁸ People use emergency services either because they do not have another source of care or because they feel that their clinician is not conveniently available. Unnecessary emergency visits can result in inappropriate diagnostic and therapeutic interventions, including antibiotic use and hospital admissions. According to The Commonwealth Fund, Americans of all incomes report greater difficulty accessing timely urgent care outside of hospital emergency departments than residents of most other industrialized countries.¹⁹

- Underuse of Cost-Effective Diagnostic Tests: Point of care testing is a technology that enables other health professionals—nurses, physician assistants, and pharmacists—to diagnose and treat many simple, common conditions that currently clog our emergency departments. These technologies could improve diagnostic accuracy in many conditions at a lower cost than conventional lab tests, and also decrease antibiotic pre-

scribing. They are readily available and affordable, yet not well adopted in clinical practice.

These opportunities to decrease waste in the health care system are displayed on the attached diagram. They provide a landscape or a potential roadmap for people to use in beginning to craft innovative policy changes that will simultaneously improve the quality of care while reducing the cost.



The Resources

A. The RAND Annotated Bibliography

As an important part of the Institute of Medicine's 2001 report: *Crossing the Quality Chasm: A New Health System for the 21st Century*, a team of senior researchers at the RAND Corporation reviewed the quality of care literature published between January 1993 and July 1998. They synthesized their results into "a profile of the quality of care in the U.S." that highlighted examples of overuse, underuse, and misuse of health care services. Their literature review, bibliography, and annotated examples of poor quality of care are an excellent source of data for policy changes to improve the quality of patient care and decrease its cost. The review is published as an appendix to *Crossing the Quality Chasm* and is also included in this report as an important resource.

B. NEHI Compendium

In order to update the groundbreaking IOM report from the last RAND evidence reviews done in 1998, NEHI created a new, annotated compendium of methodologically reliable studies that appeared in the literature from 1998 through March of 2006. The NEHI reviewers worked with the National Library of Medicine and Countway Medical Library in Boston to locate 3,000 articles on waste and inefficiency in health care, ultimately narrowing them to 462 studies that met the review criteria.

Because many of the articles addressed multiple conditions and services, they were classified into relevant disease conditions (heart disease, diabetes, etc.), services (drugs, pro-

cedures, etc.), and mechanisms of waste (Misuse, Overuse, Underuse and Utilization Variation).

From these analyses, 578 specific examples of clinical waste emerged. These examples were categorized into "clusters of evidence" based on the quantity and consistency of the examples found in the literature. Each "cluster of evidence" addressed a single medical condition, service, and mechanism of waste and serves as a tangible example of how waste in health care can be identified and reduced.

The database has been constructed in such a way that the reader can search for information by many variables: by condition, by service, by mechanism of waste, by site of care, etc. We recognize that these analyses of the peer-reviewed literature offer an incomplete picture of waste, because they only reflect what health services researchers have chosen to investigate and publish. An electronic, searchable version of the database can be found at www.nehi.net.

We also acknowledge that despite our best efforts to capture all relevant articles published between 1998 and 2006, some articles were likely missed. We strongly believe, however, that the omission of some articles has not prevented us from creating a thorough compendium that reflects the landscape of waste in clinical care.

Endnotes

- ¹ Borger, C., Smith, S., Truffer, C., Keehan, S., Sisko, A., Poisal, J., Clemens, M.K., Health spending projections through 2015: Changes on the horizon. *Health Affairs*; 2006; 25: 61-73.
- ² Midwest Business Group on Health. Reducing the Costs of Poor Quality Health Care Through Responsible Purchasing Leadership. Accessed November 17, 2006, at <http://www.mbg.org>.
- ³ Ibid.
- ⁴ The Care of Patients with Severe Chronic Illness: An Online Report on the Medicare Program by the Dartmouth Atlas Project. Center for the Evaluative Clinical Sciences, Dartmouth Medical School, 2006. (http://www.dartmouthatlas.org/atlas/2006_atlas/)
- ⁵ Wennberg, J.E., Wennberg, D.E., eds. The Dartmouth Atlas of Health Care in Michigan. Hanover, NH: Center for the Evaluative Clinical Sciences, Dartmouth Medical School, 2000.
- ⁶ Massachusetts Division of Health Care Finance and Policy. Analysis in Brief. Number 7, June, 2004.
- ⁷ Gill, J.M., Use of hospital emergency departments for nonurgent care: A persistent problem with no easy solutions. *American Journal of Managed Care*, 1999; 5: 1565-1568.
- ⁸ McCaig, L.F.; Hughes, J.M.; Trends in antimicrobial drug prescribing among office-based physicians in the United States. *Journal of the American Medical Association* 1995; 273: 214-219.
- ⁹ Gonzales R.; Malone, D.C.; Maselli, J.H., Sande, M.A. Excessive antibiotic use for acute respiratory infections in the United States. *Clinical Infectious Diseases* 2001; 33: 757-762.
- ¹⁰ Xu, K.T.; Maloney, M; Phillips, S. Economics of suboptimal drug use: cost-savings of using JNC-recommended medications for management of uncomplicated essential hypertension. *American Journal of Managed Care*, 2003; 9: 529-536.
- ¹¹ Fisher, M.A.; Avorn J. Economic implications of evidence-based prescribing for hypertension. *Journal of the American Medical Association* 2004; 291: 1850-1856.
- ¹² Finkelstein, J.A. Underuse of controller medications among Medicaid-insured children with asthma. *Arch Ped Adol Med* 2002; 156: 562-567.
- ¹³ Smith, M.J., Rascati, K.L., Johnsrud, M.T. Costs and utilization patterns associated with persistent asthma: A comparison of Texas Medicaid patients with and without continuous inhaled corticosteroid treatment. *Journal of Managed Care Pharmacy* 2001; 7: 452-459.
- ¹⁴ Thomas, E.J., Studdert, D.M., Newhouse J.P., Zbar, BIW, Howard K.M., Williams E.J., Brennan, T.A. Costs of Medical Injuries in Utah and Colorado. *Inquiry* 1999; 36: 255-264.
- ¹⁵ Ibid.
- ¹⁶ Burke J.P., Infection control - a problem for patient safety. *New England Journal of Medicine* 2003; 348: 651-656.
- ¹⁷ Pennsylvania Health Care Cost containment Council. Hospital Acquired Infections in Pennsylvania. Issue 5: July 2005.
- ¹⁸ Petersen et al. Nonurgent Emergency department visits: The effect of having a regular doctor.
- ¹⁹ Schoen, C., Osborn, R., Huynh PT, Doty, M., Peugh J, Zapert, K., Peugh, J., Davis K. Taking the pulse of health care systems: Experiences of patients with health problems in six countries. *Health Affairs* 2005; 24: suppl Web Exclusive 3 November 2005: W5-509-52