



**Wisconsin Public Health & Health Policy Institute**

# **Prioritizing Prevention Investments**

*Better Health Through Informed Policy*

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# Wisconsin Health Policy Forums

Wisconsin Health Policy Forums is a project of the Wisconsin Public Health and Health Policy Institute. Our goal is to inform state health policy debates with the best evidence and thinking available. We strive to be comprehensive, practical, relevant and fair in our selection and treatment of topics, avoiding academic jargon and partisan politics. University based, and closely linked to public and private policymakers throughout the state, we are a resource for bridging research and practice and we provide a safe forum for all voices to be heard.

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The function of protecting and developing health must rank even above that of restoring it when it is impaired.

—Hippocrates<sup>1</sup>

“How then, do public and private policymaker focus on prevention strategies that yield the most benefit for the investment?”

## Introduction

Policymakers must contend not only with limited resources and how to use them, but also with how to justify spending now in order to save money in the future. This issue brief examines this dilemma in the context of healthcare prevention.

We identify the clinical preventive services for which there is evidence of both clinical and cost effectiveness. We prioritize these services by comparing them with the fifteen most costly diseases and the impact each clinical preventive service could have on those diseases. Then we compare the resulting priorities with the priorities of *Healthiest Wisconsin 2010* (the state’s health goals) and prevention strategies in the area of long-term care compiled by the Department of Health and Family Services.

Using the list of prioritized clinical preventive services, we explore the implications of using rankings as a way to allocate health spending and we identify policy options that public- and private-sector policymakers may want to consider.

Although we compare the list of prioritized clinical preventive services with *Healthiest Wisconsin 2010* and DHFS’ long-term care priorities, the evidence behind our analysis and the methodology of prioritizing clinical preventive services are equally valid for private-sector policymakers.

Policymakers may be interested in clinical preventive services because there is ample evidence that many occurrences of disease, illness, and chronic conditions, as well as their attendant costs, could be prevented. For example, we know that:

- Half of all disease, injury, and premature death in the United States is potentially preventable.<sup>2</sup>
- Since 1900, the average U.S. lifespan has increased by more than 30 years. Twenty-five of these added years are attributed to investments in prevention.<sup>3</sup>
- Fully 70% of annual health care spending in the U.S. pays for the care of people with diseases, illnesses, and chronic conditions that could have been prevented.<sup>4</sup>

How then, do public and private policymakers focus on prevention strategies that yield the most benefit for the investment? The answer to this question is complex. Consider the factors that must be taken into account in order to reach a conclusion useful to a policymaker:

1. A preventive service must have a body of evidence proving clinical effectiveness. Clinical preventive services that do not improve health are obviously of no use to anyone.
2. If a preventive service is clinically effective, there must be a determination of whether it is also cost effective. A clinical preventive service that improves health but which costs \$1 million for every person who is treated is of little use to policymakers with constrained resources.

3. A consistent method for determining cost effectiveness must be applied to a large number of possible clinical preventive services so common assumptions are used in evaluating each service. A focus on a single clinical preventive service provides no answers for policymakers, since valid comparisons with other clinical preventive services are not possible.
4. Clinical preventive services that are both clinically effective *and* cost effective *and* comparable with each other must be compared with the diseases and conditions costing the most money to treat in order to arrive at a conclusion about which services should be priorities.

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"A critical challenge lies in the lack of consistent standards for collecting and presenting the data needed to determine which investments are best."

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One critical challenge, however, lies in the lack of consistent standards for collecting and presenting the data needed to determine which investments are "best." There is a substantial body of work regarding the clinical effectiveness of different preventive services. These are an important base for determining which clinical preventive services to pursue, but do not provide a final answer because they lack a cost component. There is a growing body of evidence regarding the cost effectiveness of various clinical preventive services, but they cannot be compared with each other because consistent standards were not used to collect and present the data.

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"...work published by the Partnership for Prevention and explained in greater detail below, is the basis for this issue brief."

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We could find only one body of work that addresses the first three factors listed above. This work, published by the Partnership for Prevention is the basis of this issue brief and is explained in greater detail in the following pages.

Using the information from the Partnership study, we developed a method to identify which clinical preventive services are clinically effective, cost effective when compared with other preventive services, address the diseases that cost the most to treat, and have the ability to address the underlying factors leading to increased costs for treating those diseases.

# Comparing the Top Clinical Preventive Services with State and DHFS Priorities

“...we identify the clinical preventive services that our research concluded are clinically effective, cost effective when compared with other preventive services, address the diseases that cost the most to treat, and have the ability to address the underlying factors leading to increased costs for treating those diseases.”

In this section we identify the clinical preventive services we have identified as clinically effective and cost effective when compared with other preventive services, that address the diseases that cost the most to treat, and that have the ability to address the underlying factors leading to increased costs for treating those diseases.

## The Top Clinical Preventive Services

The top five clinical preventive measures meeting the criteria listed above are:

- Assess adults and adolescents for tobacco use and provide tobacco cessation counseling, including advice to quit.
- Screen for hypertension among all persons.
- Screen for high blood cholesterol among men aged 35-65 years and women aged 45-65 years.
- Assess physical activity patterns of all persons aged 2 and above and counsel on increasing activity levels.\*
- Assess dietary patterns of persons aged 2 and above and provide counseling on: intake of fat/cholesterol; caloric balance; intakes of fruits, vegetables, grains.\*

## Comparing the Top Clinical Preventive Services with Healthiest Wisconsin 2010

*Healthiest Wisconsin 2010* is the state's compilation of health problems, goals, and methods for reaching those goals. The clinical preventive services listed above correspond to four of the eleven health priorities identified in *Healthiest Wisconsin 2010*:

- Adequate and appropriate nutrition.
- Obesity, overweight, and lack of physical activity.
- Social and economic factors that influence health.
- Tobacco use and exposure.

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\* Note: Investments in physical activity and dietary patterns are included because of their overwhelming cost impact on healthcare purchasers (the cost part of our equation). If demonstrable clinical effectiveness and classical cost-effectiveness (other parts of our equation) are valued more highly than overall economic costs to society, these investments should not be included in the list of top priorities.

We note that no recommendation from the U.S. Preventive Services Task Force corresponds with *Healthiest Wisconsin 2010's* priority of mental health and mental disorders. However, the cost of these diseases is such that even without a proven clinical preventive service this priority ranked as highly as those listed above (see Table 5 in the appendix). In addition, the Task Force on Community Preventive Services is expected to issue recommendations for the treatment of depression in the near future.<sup>5</sup> In light of the high cost and evolving evidence regarding treatment of depression and other mental health disorders, policymakers may want to continue to watch for developments in this area.

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“Both Healthiest Wisconsin 2010 and the LTC priorities identify mental health and mental disease as important and such conditions rank in the top tier of costs. The Task Force on Community Prevention Services is expected to issue recommendations for the treatment of depression in the near future.”

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Four additional priorities from *Healthiest Wisconsin 2010* fall in the next tier of effective clinical preventive services:

- Access to primary and preventive health services. (But note that access to health services is only effective if the clinical screenings recommended by the U.S. Preventive Services Task Force are actually provided.)
- Alcohol and other substance abuse and addiction.
- High risk sexual behavior.
- Intentional and unintentional injuries and violence.

### **Comparing the Top Clinical Preventive Services with DHFS's Long-Term Care Priorities**

The state Department of Health and Family Services asked us to compare proven clinical preventive services with the department's long-term care priorities. These priorities have been compiled by DHFS in a document titled *Long Term Care Reform Prevention/Early Intervention Priorities* that has not been published.

Six of DHFS's long-term care priorities correspond with the top clinical preventive services listed above:

- Cardiovascular disease.
- Nutritional problems.
- Physical inactivity.
- Tobacco use.
- Chronic lung disease.
- Diabetes.

Three more long-term care priorities fall in the next tier of effectiveness:

- Alcohol and other drug abuse.
- Cancer.
- Sensory loss.

## Comparing the Top Clinical Preventive Services with the Most Costly Diseases

A comparison of the top clinical preventive services and the list of most costly diseases (*Health Affairs* article, ref. #16) shows the following intersections:

- Heart disease.
- Pulmonary conditions.
- Hypertension.
- Cancer.
- Cerebrovascular diseases.

Two diseases for which there is no recommended clinical preventive service from the U.S. Preventive Services Task Force also rank highly because of their cost:

- Mental disorders. (See note about mental health, above.)
- Arthritis.

# The Policy Implications of Prioritizing Clinical Preventive Services

The state Department of Health and Family Services asked us to compare proven clinical preventive services with the department's long-term care and *Healthiest Wisconsin 2010* priorities. The results of this comparison are listed above.

Having identified priority clinical preventive services, we issue a caveat to policymakers: the policy implications of prioritizing clinical preventive services are numerous. This is especially true in a budget-neutral context where additional money will not be spent, but funding may be shifted from other areas to the priorities determined by policymakers.

As public- and private-sector policymakers give thought to whether to focus on these priorities and, if so, to what extent, the following policy implications may be useful to consider. These include:

1. The desire of healthcare purchasers to constrain rising costs.
2. The possibility of implementing, in the present, preventive measures that will delay the need for, and reduce the expenditures that result from, long-term care in the future.
3. The desire of healthcare purchasers to purchase the highest quality care for the most competitive price, using both quality and price as factors instead of only one.
4. The existence of unbiased, nonpartisan, scientifically based information and the extent to which such information will be used by policymakers and, conversely, the extent to which other factors will play a role in decision making.

These policy issues can be re-framed as a set of questions and answers.

**Question 1** — What are the policy implications of constraining overall healthcare costs, since constraint will almost surely mean that some people will receive more clinically effective and cost-effective services through their current coverage and others will find themselves paying for or doing without services that were once covered either by government or employer health plans?

**Answer 1** — The group receiving more services may save money for: 1) themselves; 2) government and employer buyers of healthcare; and 3) society, whose taxes pay for government-sponsored programs. The group for whom services were cut will either pay more or go without some services. Arguably, many services appear medically unnecessary, at least to purchasers, and might be healthfully avoided. Nevertheless, for this group, either paying more or going without may result in a shift in users to government assistance programs such as high risk pools or Medicaid. If these programs do not also use similar methods to constrain costs, the net result may not be a savings in healthcare costs but only a shift of those costs to different payers.

“..a caveat to policymakers: the policy implications of prioritizing clinical preventive services are numerous.”

“What are the policy implications of constraining health care costs?”

**Q2** — What are the policy implications of spending money now on preventive clinical services whose payoff, in terms of cost savings, may be many years away?

**A2** — This issue reflects an ongoing concern, particularly among private-sector purchasers (employers). From the perspective of an employer, this concern can be stated thus: why should I, as an employer, invest in health prevention when the odds are great that some other employer (a competitor, perhaps) or the government will reap the rewards of those health prevention investments? This concern will only be allayed if all employers expect to contribute to prevention at a level comparable to their peers and the government. It is unlikely this will occur in the absence of action by the government, which can either provide a minimal set of preventive services or use some combination of mandates and incentives so that every employer provides these services.

It is worth noting that some current funding for prevention services may be “wasted” since a percentage of the population will die from non-related causes before they reach an age where long-term care becomes a factor.

**Q3** — What are the policy implications of purchasing preventive health services: 1) regardless of cost or quality (i.e., paying whatever is charged); 2) based on cost considerations alone; or 3) based on value — using both cost and quality considerations?

**A3** — Alternative one has resulted in a national consensus among those who pay (in both the public and private-sectors), that our healthcare costs and their rates of increase are unacceptable. Research over the past 20 years has shown that method two results in lower immediate costs, but that uncontrolled quality issues can greatly increase both near- and far-term expenses. For purchasers to make effective value-based decisions (method 3) they must have objective measures of the healthcare services they are purchasing, which they can use to make and prioritize spending decisions. Within the context of this issue brief, those measures are clinically proven benefit, cost effectiveness, costliness to society of the diseases impacted and related determinants of costliness that seem most policy sensitive.

**Q4** — Given budget-neutral assumptions, what is the impact of shifting resources from current programs and services to those that we highlight as priorities? More specifically, assuming that budgeted outlays for purchasing preventive health services do not change, what are the implications of shifting money from current prevention efforts, established through many different priorities, to different prevention services based on measures of effectiveness, efficiency or economic costs?

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“What are the policy implications of spending now, with the expectations of future cost savings?”

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“What are the policy implications of attending to, or ignoring, health care preventive services cost and quality measures?”

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“What are the policy implications of shifting money from current prevention efforts to different prevention services?”

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“What are the economic implications of shifting state health spending priorities?”

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**A4** — Withdrawing funding from one prevention program or service (for example, where there is currently a low prevalence or incidence of a problem, low costs in terms of illness or early death, or a lack of clinically proven effectiveness) may allow the disease associated with the program or service to once again flourish. In its simplest terms, a change in funding priorities may result in a boomerang effect. (This answer assumes that at one time the prevention program or service was put in place because the associated disease was a problem because of a high incidence, prevalence, or cost.)

**A4b** — If prevention programs or services were in place as a result of factors other than incidence, prevalence or costs (e.g., political, commercial or societal pressures) then policymakers should expect similar pressures if funding is withdrawn from the programs or services.

**Q5** — What are the economic policy implications of shifting state spending priorities?

**A5** — Given the assumptions upon which the priorities in this paper were developed, the long-term effects might logically include:

- Delays, particularly in the under 50 population, in the need for long-term care services.
- Reductions, in the same populations, in the lifetime healthcare expenditures incurred once long-term care services are engaged.
- Reductions across the population in lifetime healthcare expenditures, through decreases in illness, mortality and level of illness experienced by populations at risk for the diseases associated with the newly prioritized clinical preventive services.

**A5b** — If funding for low value preventive services is reduced, increased funding could become available for higher value services or for expanding the range of preventive services about which we possess strong value evidence.

**A5c** — If the methods and assumptions in this issue brief prove useful and effective for the state of Wisconsin, private health purchasers might follow suit by increasing investments in preventive services.

**Q6** — What are the policy implications of focusing attention and resource allocation efforts on clinical preventive services and costs rather than on classical public health services such as education and surveillance?

**A6** — This question brings up long-standing philosophical and practical questions, particularly in areas such as teaching / education, about “if” and “how” we should measure and evaluate the effect of our actions. If we advocate prevention services, how long do we wait, and what measures do we use, to declare the success, or failure, of that advocacy; and how do we separate often complex causes and outcomes? Further, there is no reason that some preventive services (e.g., smoking or nutritional evaluations, warnings and assistance) must occur in a clinical setting. They could just as easily take place in a community setting and perhaps the same questions about efficiency, effectiveness, and costs should be addressed for non-clinical efforts and settings. There is very little research to inform questions such as, “what preventive services are most cost-effectively supplied by public health servants versus medical clinical personnel?” And there is virtually no research comparing a wide variety of policy options such as hiring lay people to work in community settings, providing direct economic incentives or disincentives to individuals, directly paying medical personnel in clinic settings, suing or taxing the commercial interests that contribute to the problems, or buying media ads teaching people how to be healthier and live better lives.

Policymakers thinking about whether to prioritize preventive services and if so, where to take resources from, will need consider all of the policy implications identified above (plus others we have not thought of). There is no easy answer to these policy questions and a number of factors other than the evidence base will also play a role in what decisions are made. Our intent in writing this paper was to show what evidence there is for prioritizing clinical preventive services and the policy implications of prioritizing in that way. The actual decisions will have to be made by the policymakers themselves.

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“What are the policy implications of focusing attention and resource allocation efforts on clinical preventive services and costs rather than on classical public health services?”

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“There is no easy answer to these policy questions. Our intent... was to show what evidence there is for prioritizing clinical preventive services and the policy implications of prioritizing in that way.”

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## Options for policymakers

Should policymakers decide to prioritize clinical preventive services and make spending decisions based on those priorities, this section of the paper identifies possible courses of action.

### Options for Implementing Clinical Preventive Service Priorities in the Long-Term Care System

The state Department of Health and Family Services asked us to compare proven clinical preventive services with the department's long-term care priorities. These priorities have been compiled by DHFS in a document titled *Long Term Care Reform Prevention/Early Intervention Priorities* that has not been published.

If the Legislature and DHFS decide to follow the priorities identified in this paper, the detailed information provided by the U.S. Preventive Services Task Force, together with the department's own information on the implementation of clinical preventive services, should provide ample basis for the practical work needed to implement these services.

### Options for Public and Private-Sector Healthcare Purchasers

The extent to which health plans respond to these findings will depend, at least in part, on the response of healthcare purchasers. This paper was prompted by a series of questions posed by the Wisconsin Department of Health and Family Services, which serves both as the State's public health agency and as purchaser for one in seven Wisconsin residents through a variety of programs for the poor, elderly, and disabled.<sup>6</sup> Add to this the purchasing power of the Department of Employee Trust Funds, representing 240,000 State employees, retirees and their dependents,<sup>7</sup> and the State purchases health benefits for nearly one in five Wisconsin residents. The State's health purchasing decisions also have the potential to affect many more lives as private employers observe and follow the State's actions.

For purchasers of healthcare services, including employers and public-sector payers, the priority list in Table 2 and the evolving recommendations of the U.S. Preventive Services Task Force can guide efforts to improve coverage for preventive care.

The Partnership for Prevention and the National Institute for Health Care Management Foundation make the following recommendations for purchasers:<sup>8, 9</sup>

- Provide financial incentives for health plans to improve delivery rates.
- Eliminate or reduce co-payments on a core set of evidence-based preventive care services.
- Provide additional incentives for employees to receive these services (e.g., flexible work schedules to allow people to access services during working hours); services at the worksite (vaccinations, for example); and preventive service reminders coordinated with physicians (such as birthday cards with messages about preventive services that are due).

"Ample basis for the practical work needed to implement the services described herein can be obtained from the U.S. Preventive Services Task Force and information already in the hands of DHFS and private policymakers."

"...the State purchases health benefits for nearly one in five Wisconsin residents. The State's health purchasing decisions also have the potential to affect many more lives as private employers observe and follow the State's actions."

"For purchasers of healthcare, the Partnership for Prevention and the National Institute for Health Care Management Foundation make eight recommendations."

- Measure delivery of these services to hold health plans accountable.
- Reward providers who exhibit strong performance on standardized measures for the delivery of preventive care services.
- Pay physicians for the time they spend counseling patients about lifestyle changes.
- Subsidize the cost of office-based software that helps physicians track the delivery of preventive care services, generate reminder notices, and the like.
- Promote collaboration among competing health plans.

In Wisconsin, efforts along many of these lines have already begun. Healthcare providers and purchasers collaborate on ways of improving and paying for quality healthcare.<sup>10</sup> A successful statewide effort to track and improve diabetes and cardiovascular care is another example of public-private partnerships underway in Wisconsin.<sup>11</sup> The groundwork laid in these efforts could be adapted to take into account the thinking on preventive services presented in this issue brief.

### Options for Health Plans and Administrators

Our conclusions about the most effective clinical preventive services are not intended to be useful only to DHFS, the State of Wisconsin and private-sector purchasers of healthcare. Table 2 and the U.S. Preventive Services Task Force’s recommendations should also provide valuable information to health plans and healthcare administrators as they set priorities for programs and systems aimed at improving delivery of preventive services.

The Partnership for Prevention makes the following recommendations for health plans and healthcare administrators:<sup>12</sup>

- Cover high-priority services with minimal or no co-payments.
- Measure the delivery of these services to hold providers accountable.
- Support delivery of these services. For example, multi-component systems that remind providers to assess tobacco use and educate them to identify and intervene with tobacco-using patients have been found to increase delivery rates of counseling and the number of people who quit smoking. Another successful strategy is the use of standing orders for adult vaccinations, in which non-physician personnel prescribe or deliver vaccinations to client populations by protocol without direct physician involvement at the time of interaction.
- Provide financial incentives for medical group performance on these services.
- Facilitate collaborative efforts among medical groups to improve delivery rates.

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“In Wisconsin efforts along many of these lines have already begun...The groundwork laid in these efforts could be adopted to take into account the conclusions on preventive services presented in this issue brief.”

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“The Partnership for Prevention makes five recommendations for health plans and healthcare administration.”

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“Better evidence to help prioritize preventive investments might become available if policymakers and researchers:

- Seek to know more about the context in which others work
  - Develop a common language
  - Work together before research begins.”
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## Options for All Policymakers and Researchers

We noted at the beginning of this paper that the body of evidence available to policymakers seeking to prioritize prevention investments is limited. Both policymakers and researchers can address this problem by:

- Seeking to know more about the context in which others work. Knowledge about the needs and constraints of each group will improve research and increase its use by policymakers.
- Developing a common language and useful means for exchanging information so relevant research can be understood by policymakers.
- Working together before the research process begins, together identifying critical information gaps and posing questions important from a policy perspective.

In short, both policymakers and researchers have important roles to play in ensuring that research is relevant, understandable, timely, and scientifically rigorous.

## Resources for Policymakers

In reaching our conclusions about the relative priority of clinical preventive services, we used the following resources, which provide a rich source of information for public and private policymakers.

### U.S. Preventive Services Task Force

The U.S. Preventive Services Task Force (USPSTF) sets the “gold standard” for prevention in primary care settings. The USPSTF is sponsored by the federal Agency for Healthcare Research and Quality, but is an independent body of private-sector experts in prevention and primary care. The USPSTF conducts rigorous, impartial assessments of the scientific evidence for the effectiveness of a broad range of clinical preventive services. After reviewing this evidence, the USPSTF estimates the magnitude of benefits and harms for each preventive service, reaches consensus about the net benefit for each service, and issues recommendations.

In short, the USPSTF identifies those practices that are known to be effective, those that are known to be ineffective, and those for which there is insufficient evidence. The USPSTF does not do any evaluation of the cost effectiveness of preventive services.

To keep pace with the ever-changing landscape of effective clinical practice, the USPSTF regularly re-evaluates its recommendations and reviews the literature regarding promising practices. The most up-to-date U.S. Preventive Services Task Force recommendations are available on the Internet at [www.ahrq.gov/clinic/prevenix.htm](http://www.ahrq.gov/clinic/prevenix.htm).

### Partnership for Prevention

The Partnership for Prevention is a national nonprofit, nonpartisan organization with a mission of improving health by preventing disease and injury. Members include local and state health departments, professional medical organizations, insurers, pharmaceutical companies, HMOs, and Fortune 500 companies.

In 2001, the Partnership published a study ranking thirty clinical preventive services recommended by the U.S. Preventive Services Task Force based on their health impact *and* cost-effectiveness. To the best of our knowledge, this study stands alone in applying a single cost-effectiveness methodology across a broad range of recommended clinical preventive services and ranking those services based on both clinical and cost effectiveness.<sup>13</sup> We chose the Partnership study as the basis for this issue brief because it makes possible a comparison among a variety of spending options, providing a solid evidence base for policymakers interested in prioritizing clinical preventive services.

More information on the Partnership for Prevention, including the results of its 2001 ranking study and other resources for policymakers, is available at the organization’s website. Publications particularly relevant to the current discussion include:

“The U.S. Preventive Services Task Force (USPSTF) sets the “gold standard” for prevention in primary care settings.”

“The most up-to-date USPSTF recommendations are available on the internet..”

“In 2001, the Partnership for Prevention published a study ranking thirty clinical preventive services recommended by the USPSTF based on their health impact and cost-effectiveness...” This study formed the core of this issue brief.

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## Useful publications ⇨

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- *What Policymakers Need to Know About Cost Effectiveness*
- *Prevention Priorities: Employers' Guide to the Highest Value Preventive Health Services*
- *Prevention Priorities: A Health Plan's Guide to the Highest Value Preventive Health Services*
- *Nine High-Impact Actions Congress Can Take to Prevent Disease and Promote Health*

All of these publications are available at: [www.prevent.org/publications.cfm](http://www.prevent.org/publications.cfm).

### Task Force on Community Preventive Services

The Task Force on Community Preventive Services picks up where the U.S. Preventive Services Task Force recommendations and Partnership for Prevention rankings leave off. The Task Force on Community Preventive Services is an independent body convened by the Centers for Disease Control and Prevention. The multi-disciplinary members of this task force include representatives of state and local health departments, managed care, academia, behavioral and social sciences, communications sciences, mental health, epidemiology, quantitative policy analysis, decision and cost-effectiveness analysis, information systems, primary care, and management and policy.

The Task Force on Community Preventive Services publishes the *Guide to Community Preventive Services*, an assessment of the available evidence on the effectiveness and cost-effectiveness of community preventive health services and recommendations based on that evidence. This publication is intended to provide policy makers with information on effective and cost-effective public health strategies and policies at the community level.<sup>14</sup>

More information on the *Guide to Community Preventive Services* is available at [www.thecommunityguide.org](http://www.thecommunityguide.org).

### Wisconsin-Specific Resources

State law requires the Department of Health and Family Services (DHFS) to produce a state health plan once a decade. *Healthiest Wisconsin 2010: A Partnership Plan to Improve the Health of the Public* identifies eleven health priorities and describes the process used in their development. Table 1 shows Wisconsin's health priorities and the health conditions and risk factors that underlie them.

Table 1 also lists DHFS's prevention priorities for the long-term care system. These priorities have been compiled by DHFS in a document titled *Long Term Care Reform Prevention/Early Intervention Priorities* that has not been published.

Many of the priorities in *Healthiest Wisconsin 2010* and DHFS's long-term care document are consistent, but they were derived through different processes. DHFS, as the state's public health agency and healthcare purchaser for nearly one in every seven Wisconsin residents,<sup>15</sup> requested that these identified priorities be included in the current analysis.

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"The Task Force on Community Preventive Services publishes the *Guide to Community Preventive Services*..."

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“...the evidence behind this analysis and the methodology of prioritizing clinical preventive services are equally valid for private-sector healthcare purchasers and health plan administrators designing benefit plans.”

“The importance of Table 2 (page 20) to this analysis”

## How we prioritized clinical preventive services

In this issue brief we develop one method for using scientific evidence to determine which disease prevention and health promotion efforts make the best fiscal investments. Although we use *Healthiest Wisconsin 2010* and DHFS’s long-term care priorities as the object of our analysis, the evidence behind that analysis and the methodology of prioritizing clinical preventive services are equally valid for private-sector healthcare purchasers and health plan administrators designing benefit plans.

By comparing the state’s health and long-term care priorities with the scientific evidence regarding clinical preventive services, we emphasize the preventive services that could be used most effectively by policymakers. These results are summarized in the last two columns of Table 2.

### Factors Considered in Ranking Clinical Preventive Services

Table 2 presents all of the information we used in reaching our final ranking of clinical preventive services, with the ranking itself at the far right of the table. It is our way of walking the reader through the process we used to identify clinical preventive services that offer the best proven investments of health dollars.

Table 2 considers which clinical preventive services fulfill all of these criteria:

- They are effective at lessening the clinically preventable burden of disease.
- They are cost effective among alternatives that produce a common effect.
- They address diseases that are the most costly to treat.

Information on these factors came from the U.S. Preventive Services Task Force, the Partnership for Prevention, the National Medical Expenditure Survey, and DHFS.

In addition, Table 2 takes into account the broad factors driving changes in spending and the relative importance of each factor. These factors include:

- Increases in cost per treated case (due, for example, to more costly treatment options or professional rate increases).
- Increases in treated prevalence of the disease (due, perhaps, to actual spread of the disease, heightened awareness or improved screening).
- Increases in overall populations (for example, when baby boomers become susceptible to a disease) or groups within those populations (for example, when diabetes “spread” to young people).

Data on these factors comes from a recent *Health Affairs* article detailing the growth in spending between 1987 and 2000 on the top 15 most costly medical conditions.<sup>16</sup>

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“Table 2 represents only one method for deciding where to invest health dollars. This model can be readily altered to reflect differing assumptions or differing weightings of those assumptions.”

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“Clinically preventable burden means...”

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“Cost effectiveness means...”

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“Information on the fifteen most costly diseases comes from a Health Affairs article detailing the growth in spending between 1987 and 2000 on the top 15 most costly medical conditions.”

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Table 2 synthesizes these resources to generate a ranked order of clinical preventive services. The letters and numbers in Table 2 are the same letters and numbers used in Table 1 for the state’s health priorities (capital letters), the state’s long-term care priorities (small letters), and the fifteen most costly disease states (numbers) that are listed in the last three columns of Table 1.

A detailed description of each column in Table 2 and the process by which we determined which clinical preventive services to prioritize, including raw numbers, assumptions, and ranking, weighting and scoring schemes, are included in the appendix to this paper. This detailed information is available because Table 2 represents only one method for deciding where to invest health dollars. This model can be readily altered to reflect differing assumptions or differing weightings of those assumptions.

## Guide to Understanding Table 2

Table 2 contains the following information:

- The first column lists the clinical preventive services recommended by the U.S. Preventive Services Task Force.
- The second, third and fourth columns show how the Partnership for Prevention ranked the relative value of each clinical preventive service as measured by its clinically preventable burden *and* cost-effectiveness.<sup>17</sup> (Clinically preventable burden means the proportion of disease and injury prevented by the preventive service if it is delivered to 100% of the population at recommended intervals. Cost effectiveness refers to the cost of the preventive service divided by the years of life saved by the service.)
- The fifth and sixth columns identify which priorities in *Healthiest Wisconsin 2010* and in DHFS’ long-term care priorities correspond to the clinical preventive services listed in the first column. These letters are the same as those listed in Table 1.
- The seventh column lists which of the top fifteen most costly diseases correspond to the clinical preventive services in column one. Information on these fifteen diseases comes from a recent *Health Affairs* article detailing the growth in spending between 1987 and 2000 on the top 15 most costly medical conditions.<sup>18</sup>
- Column eight lists which of the six most costly diseases correspond to the clinical preventive services in column one.
- The ninth column shows which of the diseases in column eight were affected most by rising costs due to increased costs of treating each case or increased prevalence of the disease (as opposed to demographic changes). These diseases may be the most effective intervention targets.
- The tenth column combines the information in the previous two columns, showing which diseases are among both the most costly and the best targets of clinical preventive services.

- The final two columns show the final score for each clinical preventive service listed in the first column and the rank order of these diseases based on the final score. How we arrived at this score is defined in detail in the appendix.
- At the bottom of Table 2, the last line lists the priorities in *Healthiest Wisconsin 2010*, the Department's long-term care priorities, and the most costly diseases that have no corresponding clinical preventive service recommended by the U.S. Preventive Services Task Force.

Developing Wisconsin's health priorities involved identifying priority health conditions; examining and ranking the risk factors associated with those conditions; and building health priorities to address those risk factors. The results of each step in the process appear below. Alphabetical and rank ordering are as presented in the original report. Only the results of the last step, the eleven health priorities, are used elsewhere in this paper.

Table 1  
**Healthiest Wisconsin 2010\* Priorities, DHFS Long-term Care Prevention Priorities, and the 15 Most Costly Diseases**

Fifty-four priority health conditions	Fifteen top ranked risk factors	Eleven health priorities	Wisconsin Long Term Care Reform Prevention/Early Intervention Priorities, 1997-2005**	Fifteen Most Costly Medical Conditions in the U.S., 2000***
Alphabetical, not prioritized	Ranked by level of contribution to priority health conditions	Alphabetical, not prioritized	As presented in the article report: alphabetical, not prioritized	As presented in the article: ranked by percentage of change in total health care spending associated with the condition, 1987-2000
<ul style="list-style-type: none"> <li>• Adverse conditions resulting from healthcare</li> <li>• Airborne infections</li> <li>• Alcohol abuse</li> <li>• Alzheimer's disease</li> <li>• Asthma</li> <li>• Autism</li> <li>• Breast cancer</li> <li>• Cerebrovascular disease</li> <li>• Chronic obstructive pulmonary disease</li> <li>• Colorectal cancer</li> <li>• Congenital anomalies</li> <li>• Congestive heart failure and other heart disease</li> <li>• Degenerative disc disease</li> <li>• Dental disease</li> <li>• Depression</li> <li>• Diabetes</li> <li>• Domestic abuse and neglect</li> <li>• Drug abuse</li> <li>• Eating disorders</li> <li>• Epilepsy</li> <li>• Farm injuries</li> <li>• Food and waterborne disease</li> <li>• Food insecurity</li> <li>• Gestational diabetes</li> <li>• Hearing impairment</li> <li>• Hepatitis B</li> <li>• Hepatitis C</li> </ul>	<ul style="list-style-type: none"> <li>• HIV infection and AIDS</li> <li>• Homicide and injuries purposely inflicted by others</li> <li>• Hypertension</li> <li>• Ischemic heart disease</li> <li>• Lead poisoning</li> <li>• Low birth weight</li> <li>• Lung cancer</li> <li>• Melanoma/skin cancer</li> <li>• Motor vehicle accidents</li> <li>• Multiple sclerosis</li> <li>• Neonatal sepsis</li> <li>• Osteoporosis</li> <li>• Parkinson's disease</li> <li>• Pneumonia/ influenza</li> <li>• Pre-eclampsia/toxemia</li> <li>• Primary arthritis</li> <li>• Prostate cancer</li> <li>• Reactive arthritis</li> <li>• Schizophrenia and other psychoses</li> <li>• Sexual assault</li> <li>• Sexually transmitted disease</li> <li>• Suicide and other self-inflicted injuries</li> <li>• Teen pregnancy</li> <li>• Urinary incontinence</li> <li>• Vector-borne infectious disease</li> <li>• Workplace injuries</li> </ul>	<p>A. Access to primary and preventive health services</p> <p>B. Adequate and appropriate nutrition</p> <p>C. Alcohol and other substance abuse and addiction</p> <p>D. Environmental and occupational health hazards</p> <p>E. Existing, emerging, and re-emerging communicable diseases</p> <p>F. High risk sexual behavior</p> <p>G. Intentional and unintentional injuries and violence</p> <p>H. Mental health and mental disorders</p> <p>I. Obesity, overweight, and lack of physical activity</p> <p>J. Social and economic factors that influence health</p> <p>K. Tobacco use and exposure</p>	<p>a. AIDS/HIV</p> <p>b. Alcohol and other drug abuse</p> <p>c. Alzheimer's disease and related dementias</p> <p>d. Arthritis</p> <p>e. Cancer</p> <p>f. Cardiovascular disease</p> <p>g. Chronic lung diseases</p> <p>h. Depression</p> <p>i. Diabetes</p> <p>j. Falls and injuries</p> <p>k. Influenza and pneumococcal diseases</p> <p>m. Misuse of medications</p> <p>n. Nutritional problems</p> <p>o. Oral diseases</p> <p>p. Physical inactivity</p> <p>q. Sensory loss</p> <p>r. Social isolation</p> <p>s. Tobacco use</p> <p>t. Urinary incontinence</p>	<ol style="list-style-type: none"> <li>1. Heart disease</li> <li>2. Pulmonary conditions</li> <li>3. Mental disorders</li> <li>4. Cancer</li> <li>5. Hypertension</li> <li>6. Trauma</li> <li>7. Cerebrovascular disease</li> <li>8. Arthritis</li> <li>9. Diabetes</li> <li>10. Back problems</li> <li>11. Skin disorders</li> <li>12. Pneumonia</li> <li>13. Infectious disease</li> <li>14. Endocrine</li> <li>15. Kidney</li> </ol>

\* Healthiest Wisconsin 2010: A Partnership Plan to Improve the Health of the Public

\*\* Long Term Care Reform: Analysis of Prevention/Early Intervention Strategies

\*\*\* Thorpe KE, Florence CS, Joski P. Which Medical Conditions Account for the Rise in Health Care Spending? Health Affairs. 25 August 2004. Web exclusive.

Table 2

## Establishing Priorities Among Recommended Clinical Preventive Services

Clinical Preventive Services Recommended by the U.S. Preventive Services Task Force, 1996	Partnership for Prevention Relative Value Study, 2001			Wisconsin-Specific Recommendations		Health Spending Analysis (details in Appendix)					
	CPB	CE	Total	Healthiest/W/2010 Priorities	DHFS LTC Priorities	Diseases Affecting Spending	Most Costly Diseases	High Impact Diseases	Combined Cost & Impact	Final Scoring	Recommended Order of Funding
Vaccinate children: DPT/DTap, MMR, Oral Polio/IPV, Hib, Hep B, Varicella	5	5	10	E		13				3	
Assess adults for tobacco use and provide tobacco cessation counseling	5	4	9	K	sg	1,2,4,5,7	1,2,4,5	2,5	1,2,5	10	1
Screen for vision impairment among adults aged 65+	4	5	9	G	q	6	6			6	
Assess adolescents for drinking and drug use and counsel on alcohol and drug abstinence	3	5	8*	C	b	6	6			6	
Assess adolescents for tobacco use and provide an antitobacco message or advice to quit	4	4	8*	K	s	1,2,4,5,7	1,2,4,5	2,5	1,2,5	10	1
Screen for cervical cancer among sexually active women or 18+ years	5	3	8	(F)	e	4	4			6	
Screen for colorectal cancer (FOBT and/or sigmoidoscopy) among all persons aged 50+ years	5	3	8	B	e	4	4			6	
Screen for hemoglobinopathies, PKU, and congenital hypothyroidism among newborns	3	5	8	(A)						3	
Screen for hypertension among all persons	5	3	8	B,I,J	f(i)	5	5		5	9	3
Vaccinate adults aged 65+ years against influenza	4	4	8	E	k	13				3	
Screen for chlamydia among women aged 15 to 24 years	3	4	7*	F		13				3	
Screen for high blood cholesterol among men aged 35 to 65 years and women aged 45 to 65 years	5	2	7	B,I	f	1	1	1	1	7	4
Screen for problem drinking among adults and provide brief counseling	4	3	7*	C	b	6	6			6	
Vaccinate adults aged 65+ years against pneumococcal disease	2	5	7	E	k	12				3	
Assess infant feeding practices and provide counseling on: breastfeeding, use of iron-enriched foods, risk of baby-bottle tooth decay	1	5	6	B	n					3	
Assess risk of STDs (including HIV) and provide counseling on measures to reduce risk	3	3	6*	F	a	13				3	
Screen for breast cancer (mammography alone or with CBE) among women aged 50 to 69 years	4	2	6	(A)	e	4	4			6	
Screen for vision impairment at age 3 to 4 years	2	4	6*	(A)	q					3	
Assess oral health practices and provide counseling on: brushing and flossing daily, visiting a dental care provider regularly	3	2	5*	(A)	o					0	
Assess the safety practices of parents of children aged 0 to 4 years and provide counseling on: child safety seats, window/stair guards, pool fence, poison control, hot water temp, bicycle helmet	1	4	5*	G	j	6	6			3	
Counsel on risks/benefits of hormone replacement among peri- and post-menopausal women	4	1	5*							0	
Assess calcium/vitamin D intake of adolescent and adult women and counsel on use of supplements	2	2	4*	B	n					0	
Assess folic acid intake among women of childbearing age and counsel on use of supplements	1	3	4*	B	n					0	
Assess physical activity patterns of all persons aged 2+ years and counsel on increasing activity levels	3	1	4*	I	p(i)	1,2,4,5,7	1,2,4,5	2,5	1,2,5,7	7	4
Provide newborns with ocular prophylaxis to protect against gonococcal eye disease	1	3	4*	(A)	q					0	
Screen for hearing impairment among persons aged 65+ years	2	2	4*	J	q					0	
Assess dietary patterns of persons aged 2+ years and provide counseling on: intake of fat/cholesterol; caloric balance; intake of fruits, vegetables, grains	2	1	3	B,I	n <sub>i</sub> (i)	1,2,4,5,7	1,2,4,5	2,5	1,2,5,7	7	4
Assess the safety practices of all persons aged 4+ years and provide counseling on: seatbelt use, smoke detector use, firearm storage/removal from home, bicycle/motorcycle helmet use, dangers of alcohol use, protection against slip and fall hazards for older persons	2	1	3*	D,G	j	6	6			3	
Screen for rubella among women of childbearing age using serology and/or history and vaccinate	1	1	2	E		13		13		2	
Vaccinate all persons against tetanus-diphtheria (Td boosters) and/or history and vaccinate	1	1	2	(A)		13		13		2	
Priorities and spending influencers NOT addressed by the USPSTF recommendations				H	c, d, h, i, m, r, t	3, 8, 9, 10, 11, 15					

— Services that are currently measured by HEDIS. # Services that are delivered to less than 50 percent of the target population. CPB: Clinically preventable burden. CE: Cost-effectiveness.  
 \* Services for which total scores have greater uncertainty.

"...Table 2 represents a ranking of those clinical preventive actions that, relatively, have the most clinical benefit, are most cost effective, impact the disease states that are most costly to healthcare purchasers, and address the factors causing increased costs in treating the most expensive disease states."

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## Summary

Building on the best information available, and using the assumptions outlined in this report, Table 2 represents a ranking of those clinical preventive actions that, relatively, have the most clinical benefit, are most cost effective, impact the disease states that are most costly to healthcare purchasers, and address the factors causing increased costs in treating the most expensive disease states.

While much is yet to be done regarding standardization of cost effectiveness analyses, including a consistent framework for collection and evaluation of cost data, sufficient information and knowledge exist to develop and use productively an evidence-based, objective method for setting and evaluating health investment priorities. These methods can be simple to understand, inexpensive to develop and maintain, and easy to customize to reflect differing health investment goals and values.

We have used one method in this paper to suggest which clinical preventive services could be prioritized by both public- and private-sector policymakers in Wisconsin. Our conclusions, and the method used to reach them, are meant to guide public, private and individual decision-makers as they determine how and where to commit resources and to spur further discussions between policymakers and researchers about how to improve the body of evidence available to policymakers.

# Appendix

## Detailed Explanation of Methodology

### Background and Definitions

Interested readers are invited to explore the methods and limitations of the Partnership for Prevention study in two articles:

- Coffield, AB, MV Maciosek, et al. (2001). *Priorities Among Recommended Clinical Preventive Services*. Am J Prev Med 21(1):1-9.
- Maciosek, MV, AB Coffield, et al. (2001). *Methods for Priority Setting Among Clinical Preventive Services*. Am J Prev Med 21(1):10-19.

We used the following definitions, which were adapted from these papers.

**Further reading** ⇨

**Definitions used in this issue brief.**

Clinical preventive services	Clinical preventive services are interventions that health professionals provide in clinical settings to prevent disease and promote health. They are generally provided to all patients according to a recommended schedule, as opposed to diagnostic and treatment services that respond to patients' symptoms and complaints. Clinical preventive services include immunizations for children and adults, counseling to promote healthy behaviors such as exercise, and screening tests such as mammograms that detect disease before it is recognized.
Clinically preventable burden (CPB)	$CPB = (\text{burden of disease targeted by the service}) \times (\text{effectiveness of the service})$
Cost effectiveness (CE)	$\text{Cost effectiveness} = (\text{costs of prevention} - \text{costs averted}) / (\text{quality-adjusted life years saved})$
Effectiveness	$\text{Effectiveness} = (\text{percent who would accept the preventive service once offered})$ $\times (\text{sensitivity of screening or assessment})$ $\times (\text{adherence with follow-up treatment or advice to change behavior})$ $\times (\text{effectiveness of prevention, treatment, or behavior change})$
Quality-adjusted life year (QALY)	Quality-adjusted life years (QALYs) are a recommended and increasingly common measure of health outcomes in cost-effectiveness analyses. QALYs measure health status over time by adding the number of years of life at full health to years of life lived with illness or disability, where a year spent with illness or disability receives a lower weight than a year in full health. Similarly, QALYs lost is a measure of the consequences of disease or injury in which the years of premature death (life years lost) are added to years spent with illness or disability.

## Description of Table 2 contents

Column(s)	Description and Caveats	
1-4	Clinical Preventive Services, CPB, CE, and Total	<p>Source: <i>Prevention Priorities: Employers' Guide to the Highest Value Preventive Health Services</i>.<sup>19</sup></p> <p>The recommendations are ordered by their total scores which were composed of adding the 1-5 ranking given to the Clinically Preventable Burden (CPB) and the 1-5 ranking assigned to the Cost Effectiveness (CE) factors. Therefore the maximum total is 10 (e.g., Vaccinate children) and the minimum is 2 (e.g., Vaccinate all persons against tetanus-diphtheria).</p>
5	Healthiest WI 2010 Priorities	<p>The authors assigned to each USPSTF recommendation the corresponding health priority(ies) from <i>Healthiest Wisconsin 2010</i>.<sup>20</sup> Some recommendations, such as screening for hypertension, were judged to apply to multiple priorities: appropriate nutrition (B), obesity/overweight (I), and social &amp; economic factors (J). Some priorities, those in parentheses, were so broadly defined, such as access to primary &amp; preventive health services (A), that while the priority might logically encompass the USPSTF recommendation, simply having access to primary and preventive services was not judged to guarantee that the screening would be done. Further, in the case of screening for cervical cancer, the relationship between that cancer and high risk sexual behavior (F) is suspected but not fully established.</p>
6	DHFS LTC Priorities	<p>This column refers to the long-term care (LTC) priorities identified by the Department of Health and Family Services. This document is unpublished, but available from the Department.</p>
7	Diseases Affecting Spending	<p>The number in this column is derived from an analysis in <i>Health Affairs</i> of the 15 most costly medical conditions described and analyzed in Tables 3–6.<sup>21</sup> Again the reader will note that USPSTF recommendations apply to a number of disease states. For example, assess adolescents for tobacco use applies to costly medical conditions 1, 2, 4, 5, 7, representing heart disease, pulmonary disease, cancer, hypertension, and cerebrovascular disease. In other cases there were no obvious connections between the top 15 most costly conditions and the USPSTF recommendations. It is important to note that the current assignments represent best estimates by two health knowledgeable non-clinicians. For full validity and accuracy, assignment of these codes should be reviewed by a panel of practicing physicians.</p>
8	Most Costly Diseases	<p>The numbers in this column reflect whether the disease codes in column 7 are also among the top six diseases identified as most costly in Table 5.</p>
9	High-Impact Diseases	<p>These numbers represent whether the disease codes in column 7 are also among the top six “high impact” diseases identified in Table 5.</p>
10	Combined Cost & Impact	<p>These numbers represent whether the disease codes in column 7 are among the top six “combined cost + impact” diseases identified in the last column of Table 5.</p>
11	Final Scoring	<p>See description of scoring methodology, below.</p>
12	Recommended Order of Funding	<p>This column suggests an order in which to direct funding and/or policy attention among the USPSTF recommendations based upon: (Highest total CPB+CE) + (number of diseases impacted) + (the relative cost of those impacted diseases) + (the relative economic impact the policy maker might have on those disease states).</p>

## Scoring for final recommendations

With total CPB+CE > 5	3 points
Related to disease in top 6 most costly	3 points
Related to disease in top 6 highest impact	2 points
Related to disease in top 6 combined cost + Impact	1 point
If more than 1 disease is affected	1 point
Max. score this method	10 points
Avg. score of recommendations	4.0 SD=3.00

Selections for the Recommended Order of Funding were based on final scoring of one standard deviation above the mean or a score of 7 or better, with the rank of 1 given to those recommendations with the highest score, which happened to be 10.

The reader will recognize that the points used to calculate this final scoring are simply a means of weighting each component of the score based on value. Depending on the reader's concern, changing the weight of any component will change the final funding score, as well as whether a recommendation may be included in the list. The authors weighted most heavily the total of CPB+CE and most costly diseases components based on our charge to prioritize among competing health investment opportunities. We assume that a good investment is one that has the most evidence for clinical effectiveness, is the most cost effective to implement, and affects disease states that are nationally among the most costly.

### Description of Tables 3-5

Tables 3 and 4 are direct reproductions of the cost matrices published in *Health Affairs*.<sup>22</sup> We ranked the values in Tables 3 and 4 from high to low (1=highest / most, 15=lowest / least) and combined them into Table 5. Table 5 brings together the disease rankings by expense with ranking reflecting how much of those expenses are likely attributable to costs per case, rise in the number of treated cases and to simple increases in population / demographics. It also ranks the average ranks across spending conditions, attributable conditions and provides a ranking representing the combination of spending conditions plus attributable conditions.

The reader should note that simple ranking as done here does order the values sequentially from lowest to highest; however, the rank does not reflect the relative difference between the values. Consequently, the detail in Tables 3 and 4 are required to understand the relative difference between heart disease (rank #1) with spending of \$26 million in 2000 and kidney disease (rank #15) with spending of \$3 million.

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## Description of Table 6

This is our matrix, bringing together selected summary rankings from Table 5, illustrating one method of determining which diseases deserve the most attention when “economic cost of disease treatment” is combined with the “most policy relevant attributable drivers” of these diseases.

The column labeled Rank by Most Expensive was achieved by averaging the three ranked expense columns in Table 5 labeled Total Spending 2000, Best Estimate of % of Change..., and Total Change in Spending, then ranking that average so that a rank of #1 (heart disease) reflects that it was the most expensive disease across all of the slightly different measures, whereas kidney disease was the least. For illustration purposes, an “X” in the Most Expensive column denotes the top six most expensive diseases. There was a natural break between these six and the remaining diseases, but the reader might select greater or fewer diseases based on their purpose.

Columns 4 and 5 show the ranks and top seven disease states using the attributable estimate behind the changes in spending. In this case, while data reflecting Increased Cost per Case and Rise in Treated Prevalence were ranked in the usual high to low 1-15 manner, Increases Due to Population Growth were given a reverse ranking. For example (see Table 5): the condition with the highest cost increase due to population growth (trauma) (see raw data in Table 4) was ranked 15<sup>th</sup>, whereas the disease with the lowest percentage of growth attributable to population growth (cerebrovascular disease) was ranked 1<sup>st</sup>. Thus, when the rankings across these attributable factors is averaged, those diseases (trauma - rank 14<sup>th</sup> - for example) that have become most expensive due to costs per case and/or number of cases but whose growth was largely attributable to population growth (which this analysis assumes health policy can do little about) will rank relatively lower than a disease like cerebrovascular disease (rank 1) which experienced relative low cost per case combined with a high increase in treated prevalence, but was largely unaffected by increased population.

Columns 6 and 7 in Table 6 combine the ranking from the previous columns to generate an All Factors ranking. Assuming a policymaker agrees with the assumptions and weighting of this analysis, s/he can use this column to order these diseases not only by costliness but also by how much “effect” policy might have on increases in costliness. In the last column, diseases with an “XX” represent the top six opportunities for impact from a cost perspective as well as from the likelihood of policy making a difference in that cost.

Again the reader is reminded that any changes in weighting, such as the reverse ranking order of population attributable factors, will change the final rankings and require reconsideration of the diseases we have identified as Highest Impact.

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Table 3\*

Percentage of Total Change in Health Care Spending Accounted for By the Fifteen Most Costly Medical Conditions, 1987-2000.

Condiitiions	Treated Prevalence per 100,000 Spending (millions of dollars)		Percentage of chage in total health care spending associated with the condition, 1987-2000				
	1987	2000	1987	2000	Upper Bound	Lower Bound	Best-guess extimate
Heart disease	6,189	6,226	30,450.1	56,678.6	8.34	5.25	8.08
Pulmonary condtions	10,389	15,526	11,684.5	36,476.5	7.89	4.77	5.63
Mental disorders	4,373	8,575	9,935.8	34,439.1	7.79	6.51	7.40
Cancer	2,862	3,348	21,167.5	38,901.8	5.64	4.92	5.36
Hypertension	9,734	11,382	8,008.6	23,394.5	4.89	2.81	4.24
Trauma	17,866	12,338	26,527.6	41,124.2	4.64	3.79	4.64
Cerebrovascular disease	410	854	3,859.8	14,938.8	3.52	2.77	3.52
Arthrities	5,479	6,966	7,403.5	17,686.3	3.27	2.54	3.27
diabetes	2,961	4,260	8,661.1	18,287.9	3.06	1.45	2.37
Back Problems	3,400	5,092	7,964.6	17,451.0	3.02	2.11	2.99
Skin Disorders	6,754	7,990	4,758.0	12,044.5	2.32	1.95	2.26
Pneumonia	1,537	1,370	5,437.6	12,641.3	2.29	1.74	2.29
Infectious disease	6,588	5,841	3,658.0	9,849.5	1.97	1.16	1.35
Endocrine	5,515	7,322	5,247.8	10,276.9	1.60	0.79	1.18
Kidney	675	908	4,938.1	8,169.5	1.03	0.87	1.03

Source: 1987 National Medical Expenditure Survey (NMES) and 2000 Medical Expenditure Panel Survey, Household Component (MEPS-HC)

\*Exhibit from Thorpe et al, Which Medical Conditions Account for the Rise in Health Care Spending? Health Affairs, Web Exclusive, Aug. 25, 2004.

**Table 4\***

**Decomposition of Change In Nominal Health Care Spending, Fifteen Most Costly Medical Conditions, 1987-2000.**

	<b>Total Changes in spending (millions of dollars)</b>	<b>Percent Change in spending attributable to increased cost per treated case</b>	<b>Rise in treated prevalence</b>	<b>Increased population</b>
<b>Conditions</b>				
Heart disease	26,228.5	68.6	1.1	30.3
Pulmonary condtions	24,792.0	37.5	41.9	20.6
Mental disorders	24,503.3	21.1	59.2	19.7
Cancer	17,734.3	41.9	27.4	30.7
Hypertension	15,385.8	59.8	18.9	21.3
Trauma	14,596.6	169.1	-108.5	39.5
Cerebrovascular disease	11,078.9	20.8	60.3	18.9
Arthrities	10,282.8	44.3	31.6	24.1
diabetes	9,626.8	23.6	49.8	26.6
Back Problems	9,486.4	21.7	52.6	25.8
Skin Disorders	7,286.5	54.8	22.0	23.2
Pneumonia	7,203.8	93.8	-18.4	24.6
Infectious disease	6,191.6	95.2	-17.5	22.3
Endocrine	5,029.1	28.0	43.4	28.6
Kidney	3,231.4	8.8	55.8	35.4

Source: 1987 National Medical Expenditure Survey (NMES) and 2000 Medical Expenditure Panel Survey, Household Component (MEPS-HC)

Exhibit from Thorpe et al, Which Medical Conditions Account for the Rise in Health Care Spending? Health Affairs, Web Exclusive, Aug. 25, 2004.

Table 5a

**Ranking of Nominal Health Care Spending and the Spending Attributable to three Causes, Fifteen Most Costly Medical Conditions, 1987-2000**
**Ranks in Spending by Condition**

	Total Spending Year 2000	Best Estimate of % of change in Total Spending Associated with condition	Total \$ Change in Spending 1987-2000	Total	Avg	Rank of Average	Most costly
Heart disease	1	1	1	3	1.0	1	X
Pulmonary conditions	4	3	2	9	3.0	2	X
Mental Disorders	5	2	3	10	3.3	3	X
Cancer	3	4	4	11	3.7	4	X
Hypertension	6	6	5	17	5.7	6	X
Trauma	2	5	6	13	4.3	5	X
Cerebrovascular disease	10	7	7	24	8.0	7	
Arthrities	8	8	8	24	8.0	7	
Diabetes	7	10	9	26	8.7	9	
Back Problems	9	9	10	28	9.3	10	
Skin Disorders	12	12	11	35	11.7	12	
Pneumonia	11	11	12	34	11.3	11	
Infectious disease	14	13	13	40	13.3	13	
endocrine	13	14	14	41	13.7	14	
Kidney	15	15	15	45	15.0	15	

**Ranks Percent change in spending\* attributable to:**

	Increased cost per treated case	Rise in Treated Prevalence	Increased population - reverse ranking	Total	Avg	Rank of Average	High Impact	Combined: Avg Rank Costs + Wtd. Attributable	Combined: Ranked Costs + Wtd. Attributable
Heart disease	4	12	12	28	9.3	12		6.5	5
Pulmonary conditions	9	7	3	19	6.3	3	X	2.5	1
Mental Disorders	13	2	2	17	5.7	2	X	2.5	1
Cancer	8	9	13	30	10.0	13		8.5	7
Hypertension	5	11	4	20	6.7	4	X	5	4
Trauma	1	15	15	31	10.3	14		9.5	11
Cerebrovascular disease	14	1	1	16	5.3	1	X	4	3
Arthrities	7	8	7	22	7.3	6	X	6.5	5
Diabetes	11	5	10	26	8.7	10		9.5	11
Back Problems	12	4	9	25	8.3	8		9	9
Skin Disorders	6	10	6	22	7.3	6	X	9	9
Pneumonia	3	14	8	25	8.3	8		9.5	11
Infectious disease	2	13	5	20	6.7	4	X	8.5	7
endocrine	10	6	10	26	8.7	10		12	14
Kidney	15	3	14	32	10.7	15		15	15

Ranks are valued as 1=highest / most, 15=lowest / least Most Impact = (More \$ per case) + (more people being treated for the condition) + (reverses scoring points for increases in population) ie - highest pop dependence gets lowest scores In other words, from a policy viewpoint - since policy can't change population related causes, this cause is discounted.

**Table 6**

**Cost Related Action Options by Disease And Attributable Cost Changes**

	<b>Diseases</b>	Most Costly	Rank by Most Costly	High Impact - Attributable Factors	Avg Weighted Attributable Ranked	All Factors Ranked (Costs + Wtd. Attributable)	Highest Impact All Factors
1	Heart disease	X	1		12	5	XX
2	Pulmonary conditions	X	2	X	3	1	XX
3	Mental Disorders	X	3	X	2	1	XX
4	Cancer	X	4		13	7	
5	Hypertension	X	6	X	4	4	XX
6	Trauma	X	5		14	11	
7	Cerebrovascular disease		7	X	1	3	XX
8	Arthrities		7	X	6	5	XX
9	Diabetes		9		10	11	
10	Back Problems		10		8	9	
11	Skin Disorders		12	X	6	9	
12	Pneumonia		11		8	11	
13	Infectious disease		13	X	4	7	
14	endocrine		14		10	14	
15	Kidney		15		15	15	

## Tips for Policymakers Using Cost-effectiveness Studies

The technique of cost-effectiveness analysis (CEA) is often used to compare the costs and benefits of different healthcare interventions in creating better health and longer life.<sup>23</sup> By quantifying the immediate and downstream benefits, harms, and costs of interventions, CEA demonstrates the trade-offs involved in choosing among different intervention strategies to effect desired health outcomes.<sup>24</sup>

While cost-effectiveness analyses tend to define costs in terms of dollars spent, the true cost of an intervention is not the dollars spent on it, or even the resources they represent, but the health benefits that could have been achieved if the resources had been used another way.<sup>25</sup>

### Conditions Under Which Cost-Effectiveness Analysis is Relevant<sup>26</sup>

Effectiveness	Cost	
	New strategy costs more	New strategy costs less
New strategy is more effective	CEA relevant	Adopt new strategy
New strategy is less effective	Retain old strategy	CEA relevant

### Thinking Critically About Cost-Effectiveness Analysis

*Adapted from Primer on Cost-Effectiveness Analysis. Effective Clinical Practice, Sept/Oct 2000<sup>27</sup>*

Because decisions made at the outset of a cost effectiveness analysis are so critical to the usefulness of its results, critical readers should seek answers to the following questions.

- Are the relevant strategies being compared? CEA is very sensitive to the choice of strategies being compared. The selection of comparators is crucial because the elements in a cost-effectiveness ratio are calculated as differences between two alternatives. Readers need to carefully consider whether the choice being presented is really the choice that interests clinicians. Should a new intervention be compared with an old one or with no intervention? It is relatively rare that the most reasonable or only comparator is to do nothing. Usually, current medical practice suggests a more reasonable option.
- How good are the effectiveness data? It is hard to get too excited about cost-effectiveness if the effectiveness of the strategy is really unknown. Unfortunately, sometimes the analyses get way ahead of the data.
- Do the effectiveness data reflect how the strategy will be used in the real world? Even if the effectiveness data are from randomized trials, it's important to ask whether they really pertain to the population and setting in which the strategy is likely to be applied.

- Where do the data come from? The basic question here is, “Was resource use modeled, or was it measured in real practice?” In either approach, there can be considerable debate about how to attach dollar amounts to utilization counts. Critical readers should look at the utilization counts themselves and have some confidence about the face validity of the dollars attached to them.
- Who’s funding the CEA? Because they are so sensitive to both the choice of strategies and assumptions, CEAs are particularly sensitive to bias, intentional or not. Readers should consider whose benefits and costs are being considered in the CEA. This may or may not relate to the funding source.
- To what extent do the results of a study based on measurement in a particular patient population and/or a specific context hold true for another patient population and/or in a different context? Variations on the cost and effectiveness sides of the analysis may need to be adapted between locations.
- Did we get anywhere? Finally, readers may want to consider whether the entire exercise somehow helped them with a decision.

Most observers recognize that while CEAs are an important decision-making tool, they are not the only tool, and that many other factors, including ethical implications, public perceptions, and political and operational feasibility, need to be considered when prioritizing health care spending.

# ENDNOTES

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- <sup>4</sup> National Institute for Health Care Management Foundation. (2003). *Accelerating the Adoption of Preventive Health Services: Building New Partnerships and Community Commitment*. Conference proceedings available at [www.nihcm.org/prevention.pdf](http://www.nihcm.org/prevention.pdf).
- <sup>5</sup> Task Force on Community Preventive Services. [www.thecommunityguide.org/mental/default.htm](http://www.thecommunityguide.org/mental/default.htm)
- <sup>6</sup> Hladilek MK, Howe MJ, Carr RM (2004 v.). *An overview of Wisconsin Medicaid quality*. Wisconsin Medical Journal 103 no. (3):58-62 Available at [http://www.wisconsinmedicalsociety.org/uploads/wmj/Hladilek\\_Howe\\_Carr103-3.pdf](http://www.wisconsinmedicalsociety.org/uploads/wmj/Hladilek_Howe_Carr103-3.pdf).
- <sup>7</sup> Personal correspondence with Nancy Nankivil-Bennet Bennett, Director of Strategic Health Policy, Wisconsin Department of Employee Trust Funds. February 6, 2005.
- <sup>8</sup> Partnership for Prevention (2001). *Prevention Priorities: Employers' Guide to the Highest Value Preventive Health Services*. Available at [www.prevent.org/publications/PrevPriorities-Sm-Employers.pdf](http://www.prevent.org/publications/PrevPriorities-Sm-Employers.pdf)
- <sup>9</sup> National Institute for Health Care Management Foundation (2003). *Accelerating the Adoption of Preventive Health Services: Building New Partnerships and Community Commitment*. Conference proceedings available at <http://www.nihcm.org/prevention.pdf>.
- <sup>10</sup> See, for example, the work of the Wisconsin Collaborative for Healthcare Quality. <http://wchq.org/>
- <sup>11</sup> Wisconsin Collaborative Diabetes Quality Improvement Project, ongoing since 1999. [http://dhfs.wisconsin.gov/health/diabetes/Diabetes\\_Collaborative\\_Improvement\\_Project.htm](http://dhfs.wisconsin.gov/health/diabetes/Diabetes_Collaborative_Improvement_Project.htm)
- <sup>12</sup> Partnership for Prevention (2001). *Prevention Priorities: A Health Plan's Guide to the Highest Value Preventive Health Services*. Available at [www.prevent.org/publications/PrevPriorities-Sm-HealthPlan.pdf](http://www.prevent.org/publications/PrevPriorities-Sm-HealthPlan.pdf).
- <sup>13</sup> The Partnership recently convened the National Commission on Prevention Priorities, with support from the Centers for Disease Control and the Agency for Healthcare Research and Quality, to update its 2001 study. The new study is expected to be published in 2006.
- <sup>14</sup> Partnership for Prevention (2001). *Guide to Smart Prevention Investments*. Available at [www.prevent.org/publications/Invest\\_Final.pdf](http://www.prevent.org/publications/Invest_Final.pdf)
- <sup>15</sup> Hladilek MK, Howe MJ, Carr RM (2004 v.). *An overview of Wisconsin Medicaid quality*. Wisconsin Medical Journal 103 no. (3):58-62. Available at [www.wisconsinmedicalsociety.org/uploads/wmj/Hladilek\\_Howe\\_Carr103-3.pdf](http://www.wisconsinmedicalsociety.org/uploads/wmj/Hladilek_Howe_Carr103-3.pdf).

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- <sup>23</sup> Agency for Healthcare Research and Quality (2001). *Focus on Cost-Effectiveness Analysis at AHRQ*. AHRQ Publication No. 01-P023, August 2001. Fact sheet available at [www.ahrq.gov/research/costeff.htm](http://www.ahrq.gov/research/costeff.htm).
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- <sup>27</sup> *Ibid.*