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Greater Use Of Preventive Services In U.S. Health Care Could Save Lives At Little Or No Cost

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ABSTRACT There is broad debate over whether preventive health services save money or represent a good investment. This paper analyzes the estimated cost of adopting a package of twenty proven preventive services—including tobacco cessation screening, alcohol abuse screening, and daily aspirin use—against the estimated savings that could be generated. We find that greater use of proven clinical preventive services in the United States could avert the loss of more than two million life-years annually. What's more, increasing the use of these services from current levels to 90 percent in 2006 would result in total savings of $3.7 billion, or 0.2 percent of U.S. personal health care spending. These findings suggest that policy makers should pursue options that move the nation toward greater use of proven preventive services.

When is preventive medicine a good investment? Some experts have suggested that clinical preventive services—such as immunizations, screenings, and counseling—are worthwhile when they save more money than they cost. Others have suggested that the appropriate standard should instead be that prevention offer good "value" for the net dollars spent.[1–3] *Good value* can be defined as providing substantial health benefit per dollar spent net of any savings, without necessarily saving money.

The long-standing focus on prevention and its cost savings, rather than its value, has been challenged by recent analyses that question the potential for preventive services to deliver broad savings. For example, in a review of the cost-effectiveness literature on selected clinical preventive services, Louise Russell found that the evidence does not support the idea that prevention typically reduces medical costs, although it sometimes does.[4] Similarly, Joshua Cohen and colleagues warned against sweeping statements about savings through prevention and pointed to evidence indicating that the vast majority of

clinical preventive services do not save money.[5] David Brown reported in the *Washington Post* that overall costs to the health care system typically go up when disease-preventing strategies are put into practice.[6]

Although these reviews reach the same general conclusion that some clinical preventive services save money but overall they may not, none focused on the specific services that evidence-based panels recommend. The pertinent question for policy makers who want to account for both the disease and money savings is whether those evidence-based clinical preventive services offer good value for the dollar.

Others have assessed the cost-effectiveness of various interventions. But to our knowledge, until now, no one has estimated the impact on overall population health, medical costs, and medical savings when a package of evidence-based preventive services is delivered to a targeted population. This paper attempts to do that.

Cost-effectiveness models were developed to support the work of the National Commission on Prevention Priorities.[7] Using these models, we estimated the life-years saved, and total medical costs and savings, that could have been

achieved in 2006 from increased use of twenty clinical preventive services with good evidence of effectiveness. We then compared the net costs to U.S. personal health care spending to provide a context for the level of investment required to achieve those health benefits.

Study Data And Methods

DATA SOURCES The evidence-based preventive services we examined were limited to those clinical services recommended for the general population by the U.S. Preventive Services Task Force or the Advisory Committee on Immunization Practices. The services were previously evaluated for the National Commission on Prevention Priorities.[7] They include the childhood immunization series, three adult immunizations, three counseling services, and thirteen screening services. The task force recommends only primary and secondary preventive services offered by primary care clinicians to asymptomatic people in clinical settings. The included services are described in more detail in Table 1 of the online Supplemental Appendix.[8]

The models developed for the National Commission on Prevention Priorities were carefully designed so that the results for each service could be compared to those for all other services. The data to estimate the models were obtained from structured literature reviews.[9]

ANALYSES We first calculated the total life-years that could have been saved per 10,000 people in the U.S. population in 2006 if each service had been delivered to the recommended population at recommended intervals in prior years. Likewise, we calculated the medical costs and savings per person-year of intervention.

We then multiplied the costs per person-year of intervention by the size of the target population in 2006 to compute the medical costs of using the services for the U.S. population. We multiplied the life-years and medical savings by the same population size to approximate the health benefits and medical savings that could have been realized in 2006, had the population in 2006 used the services in prior years. Total medical costs, along with net medical costs (costs minus savings), were then compared to 2006 U.S. personal health care spending.[10]

In this analysis, medical costs include the initial cost of the preventive service, such as screening or counseling, plus follow-up. Follow-up costs could include diagnostic testing; pharmacotherapy; and intensive interventions, such as for weight management. Savings include the expense of all care prevented by avoiding injury and disease or by treating at an earlier stage.

We excluded the value of a patient's time spent to receive preventive services and any productivity gains from reduced illness. We did not discount future costs and savings to their present value. This budgetary approach permits direct comparisons of the results to U.S. personal health care spending, but it differs from cost-effectiveness analyses. The net costs of each service thus cannot be compared to net costs produced by cost-effectiveness analysis models.

When we used this budgetary approach, the estimates of costs and savings reflect what the net impact on U.S. personal health care spending would have been in 2006 if this package of evidence-based clinical preventive services had been used by 90 percent of the population for which each service was recommended. We calculated both the total costs and savings of providing the total package of services to 90 percent of the recommended U.S. population, and the additional—or marginal—costs and savings of increasing the use of the package from existing rates up to 90 percent.[11] The estimate of additional net costs shows the difference that could have been made in 2006 U.S. personal health care spending had these services been more widely used. The estimate of total net costs shows the impact of services that were delivered plus the additional impact of undelivered services.

Likewise, we computed the total and additional effects of achieving a 90 percent utilization rate on years of life saved for the U.S. population. We measured the additional gains in life-years to approximate the number of people who could have been alive in 2006 if they had received preventive care. We also measured the total gains in life-years to approximate the number of people who were alive in 2006 because they had received preventive care plus those who could have been alive if they had done so.

We chose an upper bound of 90 percent utilization to reflect the fact that for virtually all services, there are contraindications for some portion of the target population. The risk-benefit ratio for preventive services is an individual decision based on medical history, among other factors. Not everyone will obtain preventive services even if the services are promoted and widely available. We assumed that the services would be offered to 90 percent of the target population with no refusals.

Additional methods details, with illustrations of how calculation issues were handled and a summary of limitations of the methods, are provided in the online Supplemental Appendix.[8]

Study Results

Life-years saved, medical costs, medical savings, and net costs for twenty clinical preventive ser-

vices are shown in Exhibit 1. Services that have the potential to save the most life-years are the childhood immunization series, smoking cessation advice and assistance, discussion of daily aspirin use to prevent cardiovascular disease, and breast and colorectal cancer screening.

Clinical preventive services that produce net medical savings from the budgetary perspective include the childhood immunization series, pneumococcal immunization for adults, discussion of daily aspirin use, smoking cessation advice and assistance, vision screening in older adults, alcohol screening and brief advice, and obesity screening.

INCREASING USE FROM ZERO We estimated the total cost of 90 percent utilization of the package of services by the U.S. population in 2006 to be $72.1 billion, or 4.1 percent of U.S. personal health care spending in 2006 (Exhibit 2). The total savings resulting from 90 percent utilization is $61.9 billion. The result then is a net cost of $10.2 billion, or 0.6 percent of U.S. personal health care spending in 2006.

INCREASING USE FROM CURRENT RATES In contrast, our calculated additional cost of increasing use of these services from current levels to 90 per-cent is less than the additional savings, resulting in a small negative net cost—or savings. The additional cost of increasing use to 90 percent is $18.3 billion, or 1.0 percent of U.S. personal health care spending in 2006. The savings resulting from increasing use rates is $21.9 billion, and the net cost is −$3.7 billion, or −0.2 percent of U.S. personal health care spending in 2006.

INFLUENTIAL SERVICES These cost savings from incremental improvements in use are the result of gaps in the current use of services that have the potential to save money. Three services contributed more than $1 billion each to the net additional medical savings: tobacco cessation screening and assistance; discussing daily aspirin use; and alcohol screening with brief counseling. These three services plus colorectal cancer screening each would have contributed more 100,000 years of life in 2006 had screening been increased to 90 percent.

Large changes in any single service do not alter the results. For example, doubling the cost of the service that adds the most to the 2006 additional cost of preventive care—colorectal cancer screening—would increase our estimates of total and net costs by only 0.25 percent of U.S. personal

EXHIBIT 1

Life-Years Saved, Costs, And Savings From Twenty Evidence-Based Clinical Preventive Services (2006 Dollars)

Clinical preventive service	Life-years saved per 10,000 people per year of intervention	Medical cost of service per person per year	Medical savings of service per person per year	Annual net medical costs per person per year
Childhood immunizations	1,233.1	$306	$573	−$267
Influenza immunization	23.8	28	20	8
Pneumococcal immunization	6.4	46	113	−67
Tetanus-diphtheria booster	0.1	4	0.2	4
Discuss daily aspirin use	63.0	21	87	−66
Discuss folic acid use	2.0	9	2	7
Smoking cessation advice and assistance	97.5	10	50	−40
Alcohol screening and brief counseling	7.0	9	20	−11
Breast cancer screening	45.0	64	3	61
Cervical cancer screening	2.1	49	8	41
Chlamydia screening	0.0	18	12	6
Cholesterol screening	27.8	128	24	104
Colorectal cancer screening	40.8	46	31	15
Depression screening	0.0	42	0	42
Hearing screening	0.0	23	0	23
Hypertension screening	10.7	79	50	29
Obesity screening	1.0	10	15	−5
Osteoporosis screening	1.5	90	19	71
Vision screening (adults)	2.1	5	22	−17
Vision screening (children)	0.0	14	0	14

SOURCE Authors' analyses; sources for data used in each model are available from the authors.

Total And Additional Life-Years Saved, Costs, And Savings From Twenty Evidence-Based Clinical Preventive Services (Millions Of 2006 Dollars)

	Total life-years saved[a]	Percent of personal health care spending[b]	Additional life-years saved[c]	Percent of personal health care spending[b]
Life-years saved	7,233,195	–	2,335,140	–
Cost	$72,114	4.1	$18,281	1.0
Savings	$61,927	3.5	$21,954	1.2
Net cost	$10,188	0.6	−$3,673	−0.2

SOURCE Authors' analyses; sources for data used in each model are available from the authors. **NOTE** Costs minus savings might not add up to net costs because of rounding. [a]Cost of 90 percent utilization of twenty clinical preventive services (see Exhibit 1). [b]Percentage of personal health care spending in 2006. [c]Cost of eliminating the difference between existing use rates and 90 percent use rates.

health care spending. Similarly, doubling the savings of the service that would produce the most additional savings—smoking cessation advice and assistance—would increase our estimates of savings and decrease our estimate of net costs by only 0.4 percent of U.S. personal health care spending.

Discussion

These findings with respect to increasing use from current rates to 90 percent suggest that investing in an evidence-based package of preventive services for the general population could produce more than two million additional years of life each year they are delivered. What's more, the increased costs of doing so would be recouped. Put differently, more than two million people would have been alive during 2006—or 780 people in a city of 100,000—if preventive care had been widely delivered in prior years, all without an increase in net cost.

LIMITATIONS These findings are not without limitations.[8] Our goal was to estimate the populationwide value and net medical costs of a package of evidence-based services. Because no single service drives these results, even a large error in measuring costs or use for a service would not affect the conclusions of this paper.

Despite several compilations of published cost-effectiveness ratios, there are no prior studies of the population impact of a wide range of primary and secondary preventive services to which we can directly compare our results. Richard Kahn and colleagues recently estimated the lifetime financial impact of a different set of services.[12] Despite a different scope of services and different methods, their findings would also translate into important health benefits costing only a very small portion of U.S. personal health care spending on an annualized basis.

Reviews and registries of published cost-effectiveness ratios have shown wide variation for clinical preventive services.[2,4–5,12–15] Similarly, our prior work found wide variation in cost-effectiveness ratios with six cost-saving services among them.[7] Our prior work differs from the analysis presented here because it employed a societal perspective to capture costs beyond the medical sector and because it discounted spending and benefits realized in future years to reflect their current value. The budgetary analysis used for this study might be expected to produce different results because only medical costs are included and future spending and benefits are not discounted. However, only one additional service was found to be cost saving in this budgetary analysis: screening for obesity. This service became cost saving because the value of patient time to engage in intensive interventions following a positive screen were excluded from the current analysis.

The budgetary analysis leaves out some important nonmedical savings, such as productivity gains and reduced costs of motor vehicle accidents and crime. Net savings would have been higher had these savings been included. They may be particularly important to some decision makers and could be included in cost and cost-effectiveness analysis from various perspectives.

SPENDING EFFECTS This analysis shows what could have occurred in a single year compared to current and past use. The cumulative effect of prior years' use provides a picture of the long-run potential value of an evidence-based package of preventive services. Going forward, the costs of increasing use will occur in more immediate years than the savings. Thus, in the short run, the impact on U.S. personal health care spending would be different.

Without factoring in any savings, the marginal delivery costs of achieving 90 percent use is 1 percent of U.S. personal health care spending (Exhibit 2). Therefore, with any realistic timetable for improving use rates, the short-run impact of increasing delivery rates would be a blip

in annual medical spending increases that have averaged 7 percent per year or more since the 1960s.

Whether scaled to annual spending for the nation, annual spending per person, or health plan spending per member per month, increased use would be a virtually undetectable portion of annual health care spending increases and in the long run would be cost-neutral, once savings are factored in, while providing health benefits.

NEED TO SPECIFY PREVENTIVE SERVICES As pointed out by others, preventive services are often lumped into one large, undifferentiated group.[3] There are certainly questionable preventive services for which there is not yet good evidence of effectiveness or cost-effectiveness. Payers and consumers should focus on reputable guidelines that are based on rigorous assessments of each service's effectiveness, such as those of the U.S. Preventive Services Task Force. Efforts to improve health could be further refined by first focusing on the most valuable evidence-based services.[7] Some services with high cost savings are poorly used at present. Of those, two have very large health impact—smoking cessation advice and assistance, and discussion of daily aspirin use. Meanwhile, two services have lesser, but still important, health impacts: alcohol screening with brief counseling, and pneumococcal immunization.

INCREASING USE FROM CURRENT RATES The opportunities for cost savings were greater with increasing use from current rates than they were with getting from zero use to current rates. This is because current use is relatively low for services that can produce high cost savings. This dynamic explains our seemingly contradictory estimates indicating that increasing all services from current use to 90 percent would result in cost savings while increasing use from zero to 90 percent would result in a small increase in U.S. personal health care spending.

CONCLUSION These findings are good news for purchasers and insurers. This evidence-based package of preventive services is essentially cost-neutral, while conferring large health benefits. That is also good news for patients. Payers and policy makers should support increased use of evidence-based preventive services for the right reasons and with reasonable expectations of their impact on health spending. Preventive services, as well as diagnostic and treatment services, should be judged by their effectiveness in improving health and the resources they consume to do so. Effective clinical preventive services can achieve the dual goals of improving the health of all Americans and making prudent use of scarce resources. ∎

NOTES

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8 The online Supplemental Appendix is available by clicking on the Supplemental Appendix link in the box to the right of the article online.

9 Maciosek MV, Edwards NM, Coffield AB, Flottemesch TJ, Nelson WW, Goodman MJ, et al. Priorities among effective clinical preventive services: methods. Am J Prev Med. 2006; 31(1):90–6.

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11 National utilization rates for these clinical preventive services are primarily 2005 data obtained from the National Health Interview Survey and Behavioral Risk Factor Surveillance System. For services not examined in these surveys, we conducted literature searches for utilization rates.

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