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Impact of Broadened Coverage of Smoking Cessation Treatments on Cardiovascular Disease

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Abstract

One third of all premature tobacco-attributable deaths are due to CVD and tobacco is the cause of approximately 15% of all CVD attributable. Primary and secondary prevention strategies that combine evidenced based tobacco dependence treatment programs along with cigarette taxes and media campaigns can result in hundreds of thousand of fewer excess deaths from smoking attributable CVD. Expanded insurance from both commercial and public insurers will be greatly expanded by the recently enacted federal health care reform but barriers to reducing the avoidable morbidity and mortality that is due to tobacco use is impacted by the potential for remaining financial barriers to full insurance coverage from Americans in regions of the country with the highest smoking prevalence rates.

Keywords

smoking; cardiovascular disease; insurance benefits

Introduction

Despite long-term efforts to promote and implement evidence based tobacco dependence treatment programs in the United States, tobacco use remains the nation's greatest source of preventable morbidity and mortality and is a significant contributor to total health care costs as well as lost workplace productivity.[1] [2] The US experienced a dramatic decline in smoking rates in the years following the landmark 1964 Surgeon General's report[3] due to the combined impact of media campaigns, increased cigarette taxes and the dissemination of evidence based clinical and behavioral interventions, but in recent years the trend of declining smoking rates have leveled off among both adults and teens. The Centers for Disease Control and Prevention (CDC) report that as of 2010, approximately 19% of Americans smoke with similar rates among adults and teens.[4] This national rate is subject to substantial variation among states and regions.[4]

The Patient Protection and Affordable Care Act (ACA)[5] enacted in 2010 requires that commercial insurers, and the insurance exchanges that are required to be in place by 2014, cover and waive cost sharing for certain preventive services including evidence based tobacco treatment services. Insurance exchanges are state sponsored and regulated programs that allow individuals and families to purchase insurance at federally subsidized rates. The ACA also provides incentives for states to expand their Medicaid programs to provide benefits to greater numbers of children and adults. Currently, Medicare,[6] several state

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Medicaid programs [7–9] and a growing number of commercial insurance products[10–13] provide low or no cost sharing requirements for tobacco dependence treatment services but the ACA will substantially further reduce financial barriers among smokers that wish to use evidence based treatment programs as an aid to quitting.

Despite the progress made in increasing access to evidence based treatment amplified by the mandate established by the ACA there remain substantial barriers to addressing the national health challenge that tobacco use poses in the US. In this paper we review the health and economic effects of tobacco use and of evidence based treatment services for tobacco dependence among the general population and persons diagnosed or at risk for cardiovascular disease. We then summarize trends in insurance coverage and discuss the implications that expanded coverage for tobacco treatment may have among individuals at risk for and diagnosed with cardiovascular disease (CVD). We conclude by reviewing the remaining challenges and barriers to reducing the consequences of tobacco use on overall health and in particular for CVD in the US.

Health and Economic Effects of Tobacco Use

Tobacco use is the greatest source of preventable morbidity and mortality in the United States with approximately 500,000 premature deaths each year in the US attributable to tobacco use and second hand smoke.[4] Tobacco use is a major cause of cardiovascular disease (CVD), the leading cause of death in the United States.[2] Cigarette smokers are 2–4 times more likely to develop CVD than nonsmokers and nonsmokers who are exposed to secondhand smoke at home or work increase their risk of heart disease by 25–30%. [2] The Centers for Disease Control and Prevention (CDC) reports that 32.7% of all premature tobacco-attributable deaths are due to CVD[14] and tobacco is the cause of 14.8% of all CVD attributable deaths during 2008, the most recent year for which data is available.[15]

Tobacco use results in an estimated 6%–9% or \$193 billion in excess health care spending[16, 17] in the US. Health care costs attributable to tobacco use for some specific groups such as seniors, the medically indigent, and persons with chronic likely greatly exceeds the 9% per year national average.[18–20]

Smokers are less productive in the workplace than non-smokers; Halpern et al.[21] found that workplace absenteeism among smokers averaged 6.2 days a year, compared with 4.5 days a year among former smokers and 3.9 days a year among never smokers. Smokers are also less productive because they take more frequent or longer breaks. Reduced productivity among smokers has been found in studies conducted for US armed services personnel[22] and among commercially insured individuals in the US.[23] Workplace productivity has also been shown to increase among smokers that quit.[24, 25]

Health and Economic Impact of Evidence Based Tobacco Treatment Services

The most effective and least expensive way to reduce the health and economic consequences of tobacco is by reducing the likelihood that teens and young adults start smoking. Rivara et al.[26] found that the use of targeted media campaigns and tax increases on cigarettes would result in 108,466 fewer premature deaths and 1.6 million less years of potential life years lost among a nationally representative cohort of 18 year olds by the time they reached age 85 - with approximately two thirds of these savings attributable to lower cardio vascular disease Fishman et al.[27] report that these mortality reductions would result in net social savings of between one half million and 1.7 million 200 US dollars per year of potential life year saved, depending on assumptions about the social discount rate. California, which has

the nations' third lowest smoking prevalence rate due in part to greater tax induced cigarette prices and effective media campaigns is one prominent example of the impact that these efforts can have.[28] California's model does not distinguish between primary and secondary prevention but the coordinated and multi-faceted program is a model for other states considering similar efforts to reduce smoking prevalence.

Reducing smoking attributable cardio vascular morbidity and mortality among current smokers relies on secondary prevention strategies. These include the provision of evidence based tobacco dependence treatment programs as well as opportunities presented during teachable moments among individuals both at risk and diagnosed with cardio vascular disease that smoke.[29] The impact of secondary prevention can be dramatic: improvements in the overall mortality rate and life expectancy for both men and women in the in the US for the 30 year period ending in 2010[30] has been attributed in large part to both the use of evidence-based medical therapies and the reduced impact of risk factors that drive morbidity and mortality.[31] Ford et al. [32] examined the decrease in US deaths over this period attributable to reduced coronary disease and found that 12% of the reduction was directly due to lower smoking rates among adults. Despite these advances, estimates suggest that perhaps 80,000 additional life years now lost to coronary heart disease can be saved if the US health and public health care systems optimally use secondary prevention strategies.[31]

The health benefits of smoking cessation for reduced risk of cardiovascular disease are immediate and sustained. The risk of heart attack drops sharply within 1 year after smokers quit so that at 12 months post cessation the incremental risk of coronary heart disease is reduced to half that of a continuing smoker.[2] The risk of cardiovascular disease continues to fall so that by 15 years post quit the risk of coronary heart disease is as low as that experienced by a non-smoker.[33] Even patients who have already had a heart attack cut their risk of having another one by a third to a half if they quit smoking.

About half of all smokers attempt to quit in any year[34] and the use of evidence based tobacco dependence treatment programs can triple quit rates from between 4.5% and 6 to almost 11%.[35] Levy et al. project that full implementation of the US Public Health Service guidelines[36] could reduce the national smoking prevalence rate by almost one quarter within one year to 17.2% within 1 year.

The full range of evidence based behavioral and pharmaco-therapies recommended by the US Public Health Service are available to smokers with established cardiovascular disease. Concerns about the potential adverse consequences of pharmacological treatments have been addressed by several studies. McRobbie et al.[37] report that smokers with cardiovascular disease can safely use nicotine replacement therapy as a cessation tool and in a meta analysis Prochaska et al. [38] report no significant increase in serious cardiovascular related adverse events associated with varenicline use, a partial nicotine agonist that has been effective as a cessation aide among smokers seeking to quit.

A critical element to reducing excess smoking attributable mortality due to CVD is promoting cessation among smokers that have experienced a cardiac event. Berndt et al.[39] report that one third of cardiac patients that experience an inpatient health care episode are at high risk of continuing smoking after hospital discharge. The challenge and opportunities for addressing smoking among hospitalized cardiac patients is highlighted by Rae et al. [40] who report that after discharge for an incident acute myocardial infarction (AMI), smoking was associated with an elevated risk for recurrent coronary events but among individuals that who quit smoking after their AMI, the risk declined to that of nonsmokers by 3 years after cessation.[40] Mohiuddin [41] note the importance of providing cessation services to smokers hospitalized with cardiovascular disease but despite the presence of effective and

low cost interventions that includes behavioral and pharmacologic elements. [42] Despite the benefits of doing so, cessation services are not routinely provided to hospitalized cardiac patients. [43]

Insurance Coverage for Evidence Based Tobacco Treatment Programs

Evidence based tobacco dependence treatment programs are among the most cost effective health and preventive programs and have been shown to reduce health care costs for defined populations over time. Cromwell et al.[44] report that implementation of the US Public Health Service smoking cessation guidelines[36] would cost \$1,195 per Quality Adjusted Life Year Saved (QALY), an outcome measure that considers both increased life expectancy and the quality of the years of life gained from any health service or public health intervention. Comprehensive assessments of a wide range of health and preventive programs consistently rank evidence based tobacco treatment programs as among the highest valued health and preventive programs.[45] Tobacco dependence treatment is significantly more cost effective than many treatments that are routinely covered by health plans and insurers. For example, Curry and colleagues estimated the cost-effectiveness of full coverage for pharmacotherapy and behavioral treatment for tobacco dependence at \$883 per year of life saved, which is a fraction of the annual costs for treating mild hypertension (\$11,300) and hypercholesterolemia (\$65,511).[46]

There is evidence that full coverage of tobacco dependence treatments increases their use among smokers. McAfee reported a ten-fold increase in the use of treatments with the introduction of coverage for behavioral programs and NRT.[47] Three studies provide population-based estimates of demand for treatment with full coverage. Curry et al. [46] reported annual use of a tobacco dependence treatment benefit that provided full coverage for nicotine replacement and behavioral treatment at 12% of smokers in a managed care plan in Seattle, WA. Schauffler and colleagues [48] reported use of tobacco dependence treatment at 18% of smokers offered full coverage for nicotine replacement and/or behavioral. Among enrollees in a managed care plan in Minneapolis, patients who were aware that they had full coverage of pharmacotherapy were more likely to use medication than those unaware of coverage (42% vs. 16% used Zyban; 31% vs. 24% used NRT[49] Studies have also shown that the higher the cost sharing for treatment, the less it is used. Curry et al. [46] found that when subject to a 50% copayment, there was 59% lower use of behavioral treatment and 31% lower use of NRT. The impact of greater coverage for tobacco dependence treatment programs on the likelihood of smokers achieving cessation applies to both commercially insured individuals and low income persons insured through Medicaid. Land et al. [8] suggest that removing the barriers to the use of smoking cessation pharmacotherapy has the potential to decrease short-term utilization of hospital services.

One barrier to greater insurance coverage for tobacco dependence treatment programs has been the perception that smoking cessation actually increases health care costs among former smokers, thus reducing the economic incentive for insurers and insurance sponsors to include dependence treatment in their benefit packages. This result requires an analytic perspective and a series of highly restrictive assumptions about how social costs are calculated. Smokers are more likely to die younger so society avoids the expensive health care older persons typically require. By taking a multi-generational perspective, and by assuming that anyone who smokes is less likely to need health care for as many years as non-smokers, one can find that overall health care spending over time is less because some people smoke. While this approach is methodologically sound, it does not contradict the result that current smokers significantly increase the overall cost of health care. Moreover, the argument that smoking causes premature death thus saving downstream costs could be extended to any of the medical advances made over the last century.

A more compelling analytic approach has been used in studies showing that former smokers do experience a significant increase in health care utilization in the period immediately following cessation, [50–52] however, the post quit increase typically lasted one year. Within five years, continuing smokers used more health care and were significantly more expensive than former smokers. Thus, the higher health care costs incurred immediately following cessation were recouped.[52] Not only are former smokers less expensive than continuing smokers within five years individuals without chronic conditions who quit smoking had health care costs that were comparable to never smokers within five years. For quitters with chronic conditions, health care costs were equivalent to never smokers' within 10 years.[53] Several studies have linked the spike in health care costs evidenced at the time of cessation to expensive health care episodes,[54, 55] with Fishman et al. [51] showing significantly greater incidence of acute myocardial infarctions among quitters immediately prior to cessation.

Barriers to Improved CVD Outcomes Attributable to Tobacco Use

As noted above, the ACA mandates that commercial insurers that do not currently cover tobacco dependence treatment and newly formed health insurance exchanges join Medicare and many state Medicaid programs in extending benefits for evidence based prevention programs, specifically those that receive the highest grades of A or B from the U.S. Preventive Services Task Force (USPSTF). The USPSTF is an independent panel of scientific experts that ranks preventive services based on the strength of the scientific evidence that has documented their relative benefits and has assigned a grade of A to its recommendation that clinicians ask all adults about tobacco use and provide tobacco cessation interventions for those who use tobacco products. Thus, all commercial insurance plans and plans created under the ACA's program of health insurance exchanges will offer coverage and waive cost sharing for evidence based tobacco dependence treatment programs.

The ACA's expansion of overall insurance access and specific coverage for tobacco dependence treatment programs will reduce financial barriers for smokers seeking evidence based support for their quit attempts. However, several factors inhibit the extent to which expanded coverage will significantly contribute to lower smoking prevalence and subsequent reductions in smoking attributable cardiovascular related excess morbidity and mortality. The most critical of these factors is that smokers - even those for whom the 5 A's (Ask, Advise, Assess, Assist, and Arrange) have been successfully applied – must have a demand for the evidence based treatments that enhanced insurance access now covers. [56–59] Several studies cited above[46–48] provide evidence that smokers are sensitive to the price of cessation services such that lower out of pocket costs will increase the likelihood that smokers will use tobacco dependence treatment programs but lower prices are a necessary but not sufficient condition to ensure that smokers take advantage of evidence based cessation services.

Several studies have highlighted that the mere presence of a benefit may not impact the degree to which smokers use evidence based treatment services. Boyle et al. [49] found that adding an insurance benefit for evidence based tobacco treatment produced no change in the use of NRT or other pharmacotherapies and did not result in higher rates of quitting. Further research by the same team examined the degree to which publicizing a benefit increased smokers use of cessation services but the authors concluded that information about expanded coverage alone did not increase the likelihood that smokers attempted to quit.[60]

Limited health literacy and health numeracy[61] may also impact the degree to which smokers are either aware or completely understand the details of their insurance coverage.

The ACA requires that plain language be used by insurance exchanges to communicate benefits with the intent of limiting the degree to which literacy and numeracy are barriers to appropriate use of all services including tobacco dependence treatment.

Concerns about whether smokers will be aware of the ACA mandated benefits are amplified by the fact that many individuals newly insured through health insurance exchanges and expanded Medicaid coverage most likely have not had consistent access to health insurance and are potentially less skilled at navigating their benefits. The extant literature about the impact of a benefit on the use of services has focused on commercial insured adults within integrated health care systems. There is less guidance from the literature about the degree to which newly insured individuals using a new insurance model will be fully aware of their benefits.

Another concern about the potential reach of the extension of greater overall access to insurance coverage for evidence based tobacco dependence treatment programs is the relationship between socio demographic factors and the regional variation in smoking prevalence. Smokers are more likely to have lower educational achievement and incomes and be persons of color as well as more likely to live in Southern states. [64, 65] [66, 67] Southern states also have lower cigarette taxes and are less likely to employ media campaigns to address smoking within their communities. The governors of several Southern states have indicated that they may not direct their states to expand their Medicaid programs or initiate health insurance exchanges, the two critical elements of the ACA's effort to reduce the number of Americans without health insurance. While the ACA empowers the federal government to establish exchanges when a state chooses not to, expanded insurance coverage within states that have federally sponsored exchanges is less likely to be integrated with other initiatives such as higher cigarette taxes and media campaigns. This coordinated approach of combining insurance access to evidence based programs, cigarette taxes and media campaigns, such as has been used in California,[28,62,63] is likely critical to efforts to reduce smoking rates and states with the highest prevalence of smoking and the most challenging socio-demographic factors are less likely to follow the California model.

In addition to enhanced insurance coverage, Solberg et al. [68] note the importance of how physicians and clinical staff address the needs of their patients seeking treatment for tobacco dependence. The team examined the degree to which patients' insurance coverage for pharmacotherapy affected how physicians approached tobacco dependence treatment and found that the presence of a benefit had no effect on physician behavior other than that initiated by smokers who were aware of the coverage. This suggests that the potential of expanded insurance coverage on the use of evidence based tobacco dependence treatment might be enhanced if physicians were aware that their patients had a benefit. Stevens et al. [69] note the importance of a whole system approach to treating tobacco dependence in their examination of how health plan policies impact the degree to which tobacco dependence programs are initiated by primary care providers. The authors conclude that health plans with more comprehensive policies had greater rates of implementing tobacco treatment programs in primary care, which suggests that broader support for treating tobacco dependence will increase the chance that smokers have access to evidence based treatment services.

Conclusions

Greater use of evidence based tobacco dependence treatment programs can dramatically reduce excess morbidity and mortality due to smoking attributable CVD. Trends in insurance coverage for tobacco dependence treatment, highlighted by federal health care reform, lower financial barriers smokers may experience when using these programs. Reducing financial barriers is a critical element within a coordinated effort among the public

health and health service communities to lower the negative consequences of tobacco use in the US. Although we identify barriers to broader use of evidence based tobacco dependence programs, the opportunity to reduce annual excess CVD mortality in the US is substantial.

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