Community Preventive Services Task Force

Reducing Tobacco Use and Secondhand Smoke Exposure: Interventions to Increase the Unit Price for Tobacco Products

Task Force Finding and Rationale Statement

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Task Force Finding and Rationale Statement

Intervention Definition

Interventions to increase the unit price for tobacco products include public policies at the federal, state, or local level that increase the purchase price per unit of sale. The most common policy approach is legislation to increase the excise tax on tobacco products, though legislative actions and regulatory decisions may also be used to levy fees on tobacco products at the point of sale. Other policies that might influence tobacco product prices were not considered in this review.

Task Force Finding (November 2012)

The Community Preventive Services Task Force recommends interventions that increase the unit price of tobacco products based on strong evidence of effectiveness in reducing tobacco use. Evidence is considered strong based on findings from studies demonstrating that increasing the price of tobacco products:

- Reduces the total amount of tobacco consumed
- Reduces the prevalence of tobacco use
- Increases the number of tobacco users who quit
- Reduces initiation of tobacco use among young people
- Reduces tobacco-related morbidity and mortality

Public health effects are proportional to the size of the price increase and the scale of implementation. Based on results of the review on which this recommendation is based, an intervention that increases the unit price for tobacco products by 20% would reduce overall consumption of tobacco products by 10.4%, prevalence of adult tobacco use by 3.6%, and initiation of tobacco use by young people by 8.6%. Evidence also indicates these interventions are effective in reducing tobacco-related disparities among income groups and may reduce disparities by race and ethnicity. Economic evidence shows that raising the unit price of tobacco products substantially reduces healthcare costs and in addition can reduce productivity losses.

Rationale

Basis of Finding

The Task Force finding is based on evidence from 116 studies, including 103 studies identified in two systematic reviews published in 2011 (IARC, search period: 1982 - February 2010; Wilson et al., search period: 1998- February 2009) combined with more recent evidence (search period 2009-July 2012; 13 studies). This evaluation updates and consolidates two previous reviews conducted for The Community Guide (Hopkins et al. 2001; Community Preventive Services Task Force, 2001).

Review findings from studies on price elasticity are summarized in the table below. Included studies consistently demonstrated that changes in tobacco product prices resulted in favorable changes in important tobacco use outcomes. The Task Force concludes that policy interventions, specifically excise taxes and fees applied to units of sale, are effective in reducing tobacco use when, and because, they increase the purchase price for tobacco products.

Summary Price Elasticity Estimates for Tobacco Use Outcomes

Outcome	Study Population	Included Studies	Median Price Elasticity Estimate (IQI)
Total demand (use and amount consumed)	Adults	16	-0.37 (IQI: -0.47 to -0.29)
Total demand (use and amount consumed)	Young people	13	-0.74 (IQI: -1.13 to -0.57)
Prevalence of tobacco use	Adults	26	-0.18 (IQI: -0.31 to -0.11)
Prevalence of tobacco use	Young people*	22	-0.36 (IQI: -0.73 to -0.24)
Cessation of tobacco use	Adults	1	0.375
Cessation of tobacco use	Young people	5	0.93 (IQI: 0.37 to 1.00)
Initiation of tobacco use	Young people	7	-0.43 (IQI: -0.90, 0.00)

Price elasticity = Change in tobacco use outcome associated with a 1% increase in price.
IQI = Interquartile interval
*Elasticity estimates for tobacco use prevalence in young people capture changes in both tobacco use initiation and cessation

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In addition to overall estimates of change in tobacco use outcomes, a subset of included studies compared price elasticity estimates by income level. Findings from ten studies consistently showed greater reductions (larger price elasticity estimates) among low-income tobacco users for total demand and prevalence of tobacco use. Evidence indicates that interventions to increase the price for tobacco products are an effective approach to reducing tobacco-related disparities by income.

Price interventions also may have the potential to reduce tobacco-related disparities associated with race and ethnicity. Five studies compared price elasticity estimates for total demand and tobacco use prevalence by race and ethnicity while controlling for differences in income. Based on self-reported data, price elasticity estimates for both outcomes were greatest for Hispanic populations, followed by African-Americans, and finally white tobacco users.

Three studies used population-based data to model relationships between cigarette prices and tobacco-related mortality rates. All three studies found that cigarette price increases were associated with reductions in mortality resulting from respiratory cancers and cardiovascular disease.

Overall, results of the review demonstrate that tobacco price increases have meaningful effects on important tobacco use outcomes and substantial implications for public health. Interventions that increase the unit price of tobacco products reduce the amount and frequency of tobacco use in both adults and young people, encourage quitting among tobacco users of all ages, reduce initiation among young people, and reduce disparities in tobacco use and tobacco-related disease.

Applicability and Generalizability Issues

Of the 116 included studies, 80 were conducted in the United States, and the remaining 36 evaluated price responsiveness of populations in other high-income countries. U.S. studies examined price changes and tobacco use outcomes in national, state, and local regulatory levels and populations. In general, study samples were population-based, representative, and balanced for age and gender. Findings of the review should be broadly applicable to U.S. jurisdictions, populations, and intervention options.

Data Quality Issues

Included studies used econometric designs and methods with a mixture of cross-sectional and longitudinal comparisons. Most studies used population-based survey data to examine differences or changes in tobacco use outcomes. Cross-sectional data from multiple waves of surveys or state sales data over time also were used; the results captured changes over time, in addition to cross-sectional differences. In most studies, analyses included variables to control for important confounders, such as other tobacco control interventions.

Other Benefits and Harms

Excise taxes and fees on tobacco products generate substantial public revenues that can be used to support additional tobacco prevention and control interventions. Several states have successfully dedicated portions of generated revenue to fund comprehensive tobacco control programs. In general, evidence included in this review did not incorporate the additional impact of public revenues allocated to fund comprehensive tobacco control programs. Use of revenue to provide and enhance cessation services and treatments (such as quitlines) can also address concerns about the regressiveness of these interventions. Enforcement may be required in certain jurisdictions to address tax evasion activities such as smuggling and illicit distribution and sale of untaxed tobacco products.

Considerations for Implementation

Establishing and maintaining a high price for tobacco products is an important goal of a comprehensive tobacco prevention and control strategy. The systematic review findings confirm the public health benefits of policies to increase the unit price of tobacco products.

The World Health Organization recommends that excise tax on tobacco products account for 70% of retail price. Healthy People 2020 objectives for the U.S. target a combined federal and state excise tax increase of at least $1.50 for cigarettes and smokeless tobacco products (and call for excise tax increases on all smoked tobacco products).

Due to the scale of implementation, national legislation would provide the largest impact on tobacco use, while reducing cross-border issues and, depending on the stipulations, tobacco product substitution. Historically, however, most policy activity in the U.S. has occurred at the state level and this is likely to continue. More recently, local policies such as regulatory, health-impact, and abatement fees have allowed communities to use existing government mechanisms to address local concerns (such as the clean-up costs of tobacco product litter).

A number of barriers to implementation were identified in the review. City and local policies may be blocked by state preemption legislation. Although political opposition to excise tax or fee increases should be anticipated, surveys typically show widespread public support for excise taxes. The published literature includes case-reports of both successful and unsuccessful legislative and ballot initiatives. Successful legislative efforts have typically required coalitions organized around both public health and revenue objectives. Incorporating dedicated funding for tobacco prevention and control, especially services and support for tobacco users interested in quitting, will increase the appeal of policy proposals and address concerns centered on use of revenues.

Political deliberations on price interventions typically result in substantial media coverage, providing opportunities for public health organizations and healthcare providers to convey basic health information about tobacco use and the benefits of quitting. Policy adoption should be followed by expansion and promotion of available cessation services to support tobacco users interested in quitting and motivated to act by the impending change in product price.

Interventions that increase the price for tobacco products will change tobacco use behaviors in directions that should be anticipated. Tax and fee increases will likely stimulate some price avoidance behaviors. Individual activities such as cross-border purchases may reduce, but will not eliminate, the overall impact of price increases. Revenue-sharing agreements with tribes to include state or local excise taxes and fees on tobacco products sold in tribal outlets can protect the public health benefits of state and local price policies. Policies that treat tobacco products differently may increase substitution of tobacco products (for example tobacco users switching from cigarettes to lower-priced cigars or roll-your-own tobacco).

Economic Evidence

Evidence from the eight studies included in the economic review found that interventions that increase the unit price of tobacco products generate substantial healthcare cost savings and can generate additional savings in the form of productivity losses averted.

Studies were identified in a systematic review of the economic literature (search period: January 2000-July 2012). Seven studies used simulations to estimate the changes in healthcare costs due to an increase in the price of tobacco products, and three also considered averted productivity losses. Monetary values given here are in 2011 U.S. dollars.

The models used elasticities of demand for tobacco products that were either drawn from the literature or estimated using individual-level data, and were comparable in magnitude to elasticities found in the effectiveness review. Other model inputs varied across studies, with the greatest variation coming from measures of healthcare costs attributable to smoking.

Included studies examined the effects of price increases in the U.S. (4 studies), European countries (3 studies), and all high-income countries together (1 study). The sources of savings depended on whether authors adopted a societal perspective or a government perspective (the societal perspective provides a more complete accounting of total healthcare savings). The estimates of annual healthcare and productivity savings per capita for a 20% price increase spanned a wide range (-$0.14 to $91.02), with parameter choices driving much of the variation. The median annual savings per capita from a societal perspective was $30.17. The U.S. studies found higher healthcare cost savings than the others, and did so using generally reasonable assumptions about model parameters. The mean savings estimate from U.S. studies was $73.00 per person per year.

A study conducted by the Congressional Budget Office (2012) from the U.S. government perspective, which controlled for several important confounders, found that although healthcare costs for Medicare would increase over the long term (through 2085), the increase constituted only 0.07 percent of net program spending and was far outweighed by the increased revenue collected from the excise tax. Long-term spending on Medicaid would be reduced by the intervention.

Three studies examined the effect of tobacco price increases on productivity, and all found the intervention reduced productivity losses.

Only two studies provided economic summary measures, and the costs provided were either estimates of healthcare spending attributable to increased longevity or assumed (rather than measured) implementation costs. The first study estimated $3271/quality-adjusted life year (QALY) due to increased longevity and the second estimated $83-$2771/disability-adjusted life year (DALY) based on an assumption that intervention costs amount to 0.005-0.02% GNP each year. The two were not comparable because they considered different costs and used different units, but even with generous cost assumptions, both measures were far below standard cost-effectiveness thresholds.

Five studies estimated the tax revenue generated by a price increase, and all forecast large revenues. Any longevity costs that arose could be covered by a small fraction of the revenue collected. The IARC 2011 review found that employment was minimally affected by tobacco price increase, with either minuscule losses or net gains from the intervention.

In summary, the available economic evidence suggests that across a wide range of reasonable assumptions, interventions that increase the unit price of tobacco products generate significant healthcare cost savings. Although the number of studies evaluating changes in productivity was small, the evidence consistently indicated that price increases also reduce productivity losses.

Evidence Gaps

Evidence from this systematic review shows that tobacco price increases generate meaningful reductions in tobacco use with substantial implications for public health.

Additional research could add to the small body of evidence evaluating differences in price responsiveness by race and ethnicity. Although some studies examined price responsiveness of smokeless tobacco products, more data are needed to determine the effect of tobacco unit price increases on tobacco products other than cigarettes. Studies could examine the effects of differential price, tax, and fee environments on use of different tobacco products, which could inform future policy efforts. Additional studies and case reports of local policies to establish excise taxes and fees would provide evidence on effectiveness and identify barriers to local implementation. Finally, additional interventions with the potential to influence tobacco product prices such as minimum price laws, coupon and voucher restrictions, and restrictions on price discount programs should be considered for implementation and evaluation research.

Both effectiveness and economic assessments should capture the added impact of tobacco price interventions when revenue is dedicated to support comprehensive tobacco prevention and control programs. Future economic research should expand the small body of evidence capturing changes in productivity attributable to tobacco product price increases. Economic evaluations should also incorporate differential demand elasticity by socio-economic status. Since evidence indicates that low-income smokers have greater elasticity of demand for tobacco products than higher SES smokers, existing models may underestimate the impact of price increases for this group. Finally, more evidence is needed on the cost of policy interventions.

The data presented here are preliminary and are subject to change as the systematic review goes through the scientific peer review process.

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