The effectiveness of tobacco control policies on vulnerable populations in the USA: a review

Maya Vijayaraghavan,¹ Steven A Schroeder,² Margot Kushel¹

¹Division of General Internal Medicine, University of California, San Francisco, Zuckerberg San Francisco General Hospital, San Francisco, California, USA
²Division of General Internal Medicine, University of California, San Francisco, California, USA

Correspondence to

Dr Maya Vijayaraghavan, Division of General Internal Medicine/San Francisco General Hospital, University of California, San Francisco, UCSF Box 1364, 1001 Potrero Avenue, San Francisco 94110, California, USA; Maya.Vijayaraghavan@ucsf.edu

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ABSTRACT

Despite population-wide efforts to reduce tobacco use, low-income populations in the USA have much higher rates of tobacco use compared with the general population. The principal components of tobacco control policies in the USA include cigarette taxes, clean indoor air laws and comprehensive interventions to increase access to tobacco cessation services. In this review, we describe the effectiveness of these policies and interventions in reducing tobacco use among vulnerable populations, focusing on persons with mental health disorders and substance use disorders, persons who have experienced incarceration or homelessness, and low-income tenants of public housing. We discuss the challenges that evolving tobacco and nicotine products pose to tobacco control efforts. We conclude by highlighting the clinical implications of treating tobacco dependence in healthcare settings that serve vulnerable populations.

INTRODUCTION

With the success of population-wide public health efforts over the past four decades, the prevalence of tobacco use has declined significantly in the general population. In 2015, the prevalence of tobacco use reached a modern low of 15.4% in the USA.¹ However, prevalence remains high in vulnerable populations. Tobacco use among vulnerable populations including individuals experiencing incarceration or homelessness, persons who have severe mental illness and/or substance use disorders, persons who belong to racial/ethnic minorities or gender or sexual minorities is to 3–5 times higher than the general population.^{2–6}

Tobacco-related health disparities contribute significantly to increased morbidity and mortality in these vulnerable populations. The most common causes of death among people in prison in the USA are tobacco-induced diseases: lung cancer, ischaemic heart disease, other heart disease, cerebrovascular disease and chronic lung disease.⁷ The age-adjusted smoking-related mortality and years of potential life lost is much higher among persons experiencing incarceration than those in the general population.⁷ In the homeless population, tobacco-related chronic diseases are among the leading causes of death.^{8–9} Tobacco-attributable deaths contribute to about a quarter of the total deaths among those aged 50 years and older, and about half of the total substance-related deaths in the homeless populations.¹⁰ About half of the 444 000 deaths from tobacco use in the USA are among persons with mental health and substance use disorders.³ Persons with substance use disorders

are more likely to die from tobacco-related diseases than of drug-related or alcohol-related causes.¹¹

To meet the Healthy People 2020 goals of reducing tobacco use to <12.0% nationally,¹² the prevalence of tobacco use needs to decline substantially among vulnerable populations. Population-wide public health efforts such as cigarette taxes and clean indoor air laws has been highly effective in reducing tobacco use in the general population by reducing initiation and increasing cessation.^{13–14} Clinical interventions that include the provision of behavioural counselling and pharmacotherapy have also been effective in reducing tobacco use in the general population.¹⁵ These public health and clinical interventions also work in vulnerable populations, with varying success.

In this review, we examine the effectiveness of tobacco control policies including cigarette taxes and clean indoor air laws on reducing tobacco use in vulnerable populations. We discuss the efficacy of tobacco cessation policies to increase access to tobacco dependence services among vulnerable populations. We highlight the challenges that emerging tobacco and nicotine products pose to reducing tobacco use among vulnerable populations. We conclude by highlighting clinical implications of treating tobacco dependence in healthcare settings serving vulnerable populations.

CIGARETTE TAXES

Tobacco taxation to raise cigarette prices is one of the most effective population-based strategies to decrease cigarette-smoking prevalence.^{16–18} High cigarette pack price reduces consumption and the overall prevalence of tobacco use by promoting reduction and cessation among current smokers and uptake by youth and young adults in the USA.^{16–19} Economic theory suggests that raising cigarette prices should reduce consumption more in lower income than higher income smokers because lower income smokers are more price sensitive.^{16–19–23} However, studies have shown varying responses to price increases among low-income populations. Individuals may compensate for higher prices by relying on low-priced cigarette products (eg, bootlegged or smuggled cigarette products), foregoing other essential goods^{24–28} or reducing consumption.^{23–29–30} Critics raise concerns that cigarette taxes are regressive because they disproportionately affect low-income smokers who smoke more and also devote a higher percentage of their income towards purchasing tobacco.^{31–32} However, several studies have shown that high cigarette prices are associated with reduced consumption equally among low-income and higher income smokers,^{23–29–30} and that price increases over time

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are associated with decreased population-wide smoking prevalence.^{33 34} These studies also address the equity implications around increasing cigarette prices for low-income smokers. Studies that recommend a price increase suggest that revenue from cigarette excise taxes should be directed towards cessation programmes that help low-income smokers quit as well as programmes that alleviate their financial burden.^{29 31 35} But in actual practice, that rarely happens, as states elect to use the funds for other purposes.

Despite the progress made with taxing cigarettes, the tobacco industry has capitalised on a loophole in the federal statutory definition of cigarettes by evading federal taxes on little cigars, a combustible tobacco product packaged and marketed as cigarettes.³⁶ Little cigars are cheaper than cigarettes and are used commonly among low-income populations and youth in the USA.^{37 38} Under the current federal tax rates, this loophole costs the USA almost \$130 million in lost revenue from cigarette smokers who switch to the cheaper and lower-taxed little cigars.³⁹ A second loophole involves another law enacted in 2009 that gave the Food and Drug Administration (FDA) regulatory authority over tobacco products. Under this law, the FDA banned candy and fruit-flavoured cigarettes but not cigars or menthol-flavoured cigarettes.³⁹ As a result, the use of flavoured cigar products has increased substantially among youth/young adult populations.^{40–42} The cooling and anaesthetic effects of menthol mask the harshness of tobacco smoking, making it appealing to young adults and certain racial/ethnic minority groups.⁴³ Menthol cigarettes are heavily marketed to African/American populations who bear a disproportionate burden of tobacco-related morbidity and mortality.⁴⁴ Possible ways to close the 'little cigar' and menthol cigarette loophole are to tax all tobacco products at the same rate as cigarettes and to extend the ban of flavoured cigarettes to menthol cigarettes and other tobacco products. This measure could lead to decreased initiation of tobacco use by a substantial proportion of the youth, young adult and racially/ethnically diverse low-income populations in the USA.

CLEAN INDOOR AIR LAWS

Exposure to tobacco smoke is a major environmental hazard, responsible for over 41 000 deaths among non-smokers and 400 deaths among infants each year and approximately \$5.6 billion dollars annually in lost productivity in the USA.^{45–48} Since the surgeon general's first report on the harms of second-hand smoke (SHS) exposure in 1986,⁴⁹ significant progress has been made in implementing comprehensive smoke-free policies in all enclosed public places and workplaces, including bars, restaurants and public transportation.⁵⁰ California was the first state to ban smoking in the workplace in 1988, and since then 26 states have implemented comprehensive smoke-free laws.⁵¹ With growing awareness of the harms of SHS exposure, other settings that serve populations disproportionately affected by tobacco use have implemented smoke-free policies. We describe below the experiences of correctional facilities, psychiatric hospital, substance use recovery programmes, homeless shelters and public housing in implementing smoke-free policies.

Correctional facilities

Until recently, tobacco use was rooted in the culture of correctional facilities.^{52–54} Requests by non-smoking inmates to live in smoke-free environments and the increasing healthcare costs of incarcerated individuals led the Federal Bureau of Prisons and State Departments of Corrections to recommend tighter smoking restrictions.^{55 56} Sequential surveys of federal and state

prison systems between 1986 and 2007 showed gradual changes towards increased smoking restrictions. The proportion of prisons that distributed free tobacco to inmates decreased from 53% in 1986 to none in 2007, and the proportion with smoke-free living areas and campus-wide bans increased.^{55 57 58} By 2007, 96% of prison systems offered smoke-free living areas and 60% had enacted campus-wide bans.^{55 57 58}

Policies were associated with reductions in SHS exposure in prison,^{59 60} and reductions in mortality from smoking-related causes.⁷ There were significant reductions in cancer-related mortality among the US prison populations where bans were effective for over 9 years.⁷ Although few prisons/jails reported violations of policies, those that had enforcement policies and that restricted access to contraband tobacco were most successful in implementing smoke-free policies.⁶⁰ Most individuals who smoked prior to being incarcerated continued to smoke illegally under bans,^{53 61 62} though fewer cigarettes than prior.^{53 61 62} Few individuals quit completely, and those who did relapsed back to smoking after release.^{61 63}

Psychiatric hospitals

Similar to correctional facilities, smoking was part of the culture of psychiatric facilities. In 1991, The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) required all of its accredited hospitals, with the exception of psychiatric hospitals, to ban indoor smoking.⁶⁴ However, over the past two decades most psychiatric hospitals have voluntarily implemented indoor smoke-free policies. A survey in 1993 found that 88.1% of participating JCAHO accredited psychiatric hospitals, and general hospitals with psychiatric units were adherent to indoor smoking bans.⁶⁵ In 2009, 26% of these institutions reported campus-wide bans, and 14% reported plans to adopt such a policy.⁶⁶ Sharing a common regulatory organisation made it possible for psychiatric facilities to implement bans.⁶⁷

Among inpatient psychiatric facilities bans were associated with reduced exposure to SHS,^{68–70} but effects on cessation were mixed. While some studies found that patients in facilities with bans expressed high rates of intention to quit smoking and increased confidence in staying abstinent after discharge,^{71 72} other studies found no association with cessation.⁶⁹ This may be due to inconsistent access to pharmacotherapy and behavioural counselling for tobacco dependence during the hospitalisation, lack of smoking cessation resources after discharge, or increased nicotine dependence and co-occurring substance use disorders during hospitalisation.^{69 73–75} The majority of smokers resumed smoking after discharge from a smoke-free psychiatric hospitalisation even when offered nicotine replacement therapy during the hospitalisation.⁷⁶

Addiction treatment centres

Over the past two decades, many State Substance Abuse Agencies have prioritised treatment of tobacco dependence in state-certified addiction treatment facilities.^{77–81} In 2010, 41 of the 50 US states had policies restricting indoor smoking in state-certified treatment facilities.⁷⁷ In a recent study of nationally representative random sample of 1026 substance use recovery programmes in the USA, 98.1% had an indoor ban and 32.5% had a total outdoor ban on smoking for patients, employees and visitors.⁸² Of these state programmes, New Jersey and New York's tobacco policies are among the most comprehensive. In 2001, New Jersey implemented a tobacco control policy that included smoking bans in indoor and outdoor areas, required staff to assess clients for tobacco use and mandated treatment for tobacco dependence for both staff and clients.^{78 83}

However, adherence to the policies varied among treatment programmes.^{78 83} The New York state tobacco control policy, implemented in 2008, required all 1000 of its state-certified addiction treatment facilities to implement 100% tobacco-free grounds and provide cessations services to their clients.⁷⁹ Within 1 year of implementation, the prevalence of tobacco use among clients in 10 randomly selected New York programmes decreased from 69.4% to 62.8%.⁸⁴ A 5-year evaluation of the New York policy in a random selection of five addiction treatment programmes demonstrated that the policy was associated with reduced prevalence of tobacco use among staff and reduced consumption among clients.⁸⁵ The policy was also associated with increased awareness of tobacco addiction among clients.⁸⁵

Homeless shelters

Unlike correctional facilities, psychiatric hospitals and addiction treatment programmes where there are national data on the prevalence of smoking bans, there are no such data for homeless shelters. Recent data from California and Texas suggest that homeless shelters do have indoor smoke-free policies. An early study conducted in 2005 that focused on long-term transitional homeless shelters in Los Angeles, California, found that 75% reported an indoor 'no smoking' policy and 78% reported designated smoking areas.⁸⁶ A recent cross-sectional study, conducted in 2012 in Dallas, Texas, among sheltered homeless adults who were staying in a shelter that had an indoor ban and a partial outdoor ban showed that most participants supported the creation of an outdoor smoke-free zone, but not a complete shelter-wide smoking ban.⁸⁷ The ban was associated with decreases in consumption but was not associated with quitting.⁸⁷ Three other recent studies, conducted between 2013 and 2015, focused on homeless clientele of emergency and transitional homeless shelters in San Diego, California. A cross-sectional survey of homeless shelters in San Diego County showed that all facilities had an indoor ban on smoking, 61.5% had an outdoor designated smoking zone and 25% had a campus-wide ban on smoking.⁸⁸ In two cross-sectional studies of sheltered homeless adults, the majority of participants were supportive of indoor smoke-free policies.^{89 90} In a shelter that had an indoor and outdoor smoking ban, most homeless adults reported reductions in consumption, and about half reported either having made a quit attempt or getting ready to quit completely.⁹⁰

Public housing

Approximately half the population in the USA is protected by federal, state and local smoke-free policies; however, an estimated 58 million residents, including 15 million children aged 3–11 are exposed to SHS.⁴⁸ Exposure to SHS is disproportionately concentrated among children, persons living in poverty and those who belong to racial/ethnic minorities.⁴⁸ The home is the primary contributor of SHS exposure among children.⁴⁸

In response to the high rates of SHS exposure among non-smoking tenants of public housing, the Federal Department of Housing and Urban Development's (HUD) Office of Public and Indian Housing issued memorandums in 2009 and 2012 that 'strongly encouraged' public housing authority (PHA) housing⁹¹ to implement non-smoking policies in some or all of their public housing units.^{92 93} In 2015, HUD proposed to extend the voluntary rule to a mandatory rule that required every PHA to implement smoke-free policies that prohibited use of combustible tobacco in all living units, indoor common areas of PHA buildings and in PHA administrative office buildings.⁹⁴

They also required that the policy extend to all outdoor areas within 25 feet of housing and administrative offices.⁹⁴ PHAs were encouraged to partner with state and local health departments to increase access to cessation resources for smoking tenants of public housing. The enactment of this rule is contingent upon reviewing public commentaries on the advantages and disadvantages of the ruling.

Public housing includes 3100 PHA housing, representing 1.2 million housing units across the country. In September 2015, there were over 228 000 units that were smoke-free.⁹⁵ If the proposed rule were to become effective, it would affect over 940 000 housing units, including 500 000 households with elderly individuals or persons with disabilities and over 760 000 households with children.⁹⁵

Studies describing preferences for smoke-free policies among low-income tenants of subsidised housing have found that the majority supported such policies, but differences existed by smoking status.^{96–98} Not surprisingly, non-smokers and never smokers were more likely to support smoke-free policies compared with smokers.^{96–98} Smokers who had an intention to quit smoking within the next 6 months were more likely to support smoke-free policies in indoor living areas compared with those without an intention to quit.⁹⁷ In 2012, the Boston Housing Authority (BHA) implemented a comprehensive smoke-free policy restricting smoking in indoor units, becoming the largest housing authority to do so at that time. Studies among BHA tenants have found overall support for the policy, but dissatisfaction with lack of enforcement.⁹⁹ The few studies that have examined cessation behaviours among public housing tenants exposed to smoke-free policies have found reduced consumption and increased quit rates among smokers.¹⁰⁰

Smoke-free homes

Related to smoke-free policies in public housing, the voluntary adoption of smoke-free homes is a strong indicator of antitobacco norms.¹⁰¹ Strong clean indoor air laws are associated with increased adoption of smoke-free homes among smokers and non-smokers.^{102 103} The western part of the USA, with its strong antitobacco norms, has among the highest prevalence of households with smoke-free homes.¹⁰⁴ Smoke-free homes have been associated with reduced exposure to SHS among non-smokers and reduced smoking behaviours among low-income and higher income smokers.^{29 101 105 106} Low-income adults are less likely than higher income adults to adopt smoke-free homes,^{29 107 108} reflecting differential smoking norms in the respective communities. Despite this, brief interventions have been shown to increase adoption of smoke-free homes in low-income households.¹⁰⁹

Electronic nicotine delivery systems and threats to clean indoor air laws

The surge in the use of Electronic Nicotine Delivery Systems (ENDS), of which electronic cigarettes are the most common form, has the potential to renormalise tobacco use and pose a significant threat to the efficacy and effectiveness of clean indoor air laws in reducing tobacco prevalence. Electronic cigarettes are battery-operated devices that release aerosolised nicotine. Evidence to date has suggested that the aerosol released by electronic cigarettes can be harmful.¹¹⁰ The evidence around the use of ENDS is equivocal for aiding cessation.^{111–116} Prior to the federal regulation on the use of ENDS, state governments regulated the use of electronic cigarettes. As of November 2014, 40 states had prohibited the sales of ENDS to minors, but only 3 states prohibited the use of ENDS in private worksites,

restaurants or bars (New Jersey, North Dakota and Utah).¹¹⁷ Only three states (Pennsylvania, Nevada and Texas) did not have statewide laws prohibiting ENDS sales to minors or restricting indoor use of ENDS.¹¹⁷ In 2016, the FDA finalised a rule that extended their regulatory authority to cover all tobacco products, including vaporisers, vape pens, hookah pens, electronic cigarettes, e-pipes and all other ENDS.¹¹⁸ This regulatory authority allows the FDA to regulate the manufacture, import, packaging, labelling, advertising, promotion, sale and distribution of ENDS. The final rule will require that all manufacturers, importers and retailers register product listings with the FDA; report ingredients, and potentially harmful constituents; and place health warnings on the packages. There are also several provisions to restrict sales to minors including not allowing sales to persons <18 years of age, requiring age verification by photo ID, not allowing the sales of these products in vending machines and not allowing the free distribution of samples.

TOBACCO CESSATION POLICIES

Approximately a third of Medicaid enrollees are smokers. Healthcare costs from smoking-related chronic diseases place a huge burden on Medicaid, the largest public health insurance programme in the USA.^{119–120} An estimated 15% of all Medicaid expenditures, or \$10 billion annually, are attributable to smoking.^{119–121} Previous research has shown that state Medicaid programmes could reduce smoking prevalence, smoking-related morbidity and smoking-related costs among Medicaid enrollees by covering FDA approved cessation treatments and by eliminating barriers to accessing treatment.^{122–124}

The 2010 Patient Protection and Affordable Care Act (ACA) requires that all state Medicaid programmes cover all seven FDA-approved medications for cessation and individual, group or telephone counselling services for at least two quit attempts per year, without patient cost sharing or prior authorisation.¹²⁵ Despite these provisions in the ACA, variations exist in the implementation of coverage across states. In a survey of state Medicaid coverage conducted by the American Lung Association between August 2014 and June 2015, only nine states offered all the seven FDA-approved medications for cessation and smoking cessation.¹²⁶ However, all nine states had some barriers to treatments including copayments or prior authorisation requirements.¹²⁶ Thirty-one states covered individual counselling, 10 states covered group counselling and 30 states covered all seven medications for cessation.¹²⁶ However, common barriers included prior authorisation requirements, annual limits on quit attempts, limits on duration and required copayments.¹²⁶

In 2013, only 10% of Medicaid enrollees who were smokers had received cessation medications, and most states spent significantly less on cessation medications in comparison with the estimated cost to Medicaid from smoking-related diseases.¹²⁰ Disparities in smoking prevalence and use of state Medicaid cessation resources were greatest among non-expansion Medicaid states (19 states have not adopted the ACA Medicaid expansion) compared with those that expanded Medicaid eligibility.¹²⁰

CONCLUSIONS

Describe ways in which healthcare systems, healthcare providers and public health practitioners can improve delivery of cessation services among vulnerable populations?

Although cigarette smoking has declined over the past four decades, prevalence remains very high among vulnerable populations. Helping individuals quit smoking and preventing youth

from initiating smoking should be a top health priority for all healthcare providers. To achieve the Healthy People 2020 goal of reducing the national prevalence of tobacco use to <12%, there needs to be a concerted effort among individual providers, clinics, hospitals and healthcare systems to minimise barriers to access to cessation aids for vulnerable populations and to counsel all smokers and non-smokers living with smokers to implement voluntary home smoking restrictions. In addition to these clinical interventions, public health approaches such as increasing access to smoke-free public housing and smoke-free public spaces, legislative restrictions that restrict sales of evolving tobacco and nicotine products to youth and young adults, and tobacco price increases will help to further reduce tobacco use among vulnerable populations.

Main messages

- ▶ Despite population-wide efforts to reduce tobacco use, vulnerable populations in the USA have much higher rates of tobacco use compared with the general population.
- ▶ Exposure to secondhand smoke is disproportionately concentrated among children, persons living in poverty and those who belong to racial/ethnic minorities.
- ▶ Tobacco-related chronic diseases are among the leading causes of morbidity and mortality among vulnerable populations in the USA.
- ▶ Efforts to reduce tobacco use among vulnerable populations should include ensuring access to cessation services for all smokers and increasing exposure to comprehensive smoke-free policies for all smokers and non-smokers.

Current research questions

- ▶ Describe three major tobacco control policies that have reduced the prevalence of tobacco use in the USA?
- ▶ Describe the effects of raising cigarette prices on tobacco use and cessation behaviours among vulnerable populations?
- ▶ What are some of the effects of smoke-free policies and smoke-free homes on tobacco use and cessation behaviours?
- ▶ Describe ways in which healthcare systems, healthcare providers and public health practitioners can improve delivery of cessation services among vulnerable populations?
- ▶ Describe some of the evolving tobacco and nicotine products and the challenges they pose to tobacco control?

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Self assessment questions

Please answer true or false to the below statements.

1. Tobacco use in the USA is disproportionately concentrated among vulnerable populations including persons with severe mental illness and/or substance use disorders, and persons who have experienced incarceration or homelessness.
2. Raising cigarette taxes has been shown to reduce consumption among low-income and higher income smokers, and reduce initiation of tobacco use among youth.
3. Comprehensive smoke-free policies are associated with declines in the prevalence of smoking at the community and population level.
4. Smoke-free homes have been shown to reduce consumption, increase successful quitting and reduce relapse to smoking among smokers.
5. Under the Affordable Care Act, Medicaid is mandated to cover tobacco dependence treatment services that include all seven FDA-approved medications for cessation as well in-person and telephone counselling.
6. Despite these provisions in the Affordable Care Act, variations exist in the implementation of coverage across states.

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Answers

1. True
2. True
3. True
4. True
5. True
6. True