



Public Policy to Protect Children From Tobacco, Nicotine, and Tobacco Smoke

SECTION ON TOBACCO CONTROL

abstract

Tobacco use and tobacco smoke exposure are among the most important health threats to children, adolescents, and adults. There is no safe level of tobacco smoke exposure. The developing brains of children and adolescents are particularly vulnerable to the development of tobacco and nicotine dependence. Tobacco is unique among consumer products in that it causes disease and death when used exactly as intended. Tobacco continues to be heavily promoted to children and young adults. Flavored and alternative tobacco products, including little cigars, chewing tobacco, and electronic nicotine delivery systems are gaining popularity among youth. This statement describes important evidence-based public policy actions that, when implemented, will reduce tobacco product use and tobacco smoke exposure among youth and, by doing so, improve the health of children and young adults.

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American Academy of Pediatrics Federal advocacy efforts should be coordinated with the AAP Department of Federal Affairs in Washington, DC, and with AAP chapters on state advocacy efforts to protect children from the harmful effects of tobacco use and secondhand smoke exposure.

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STATEMENT OF PROBLEM

Tobacco use is one of the most important health threats to children, adolescents, and adults. Tobacco use harms not only individual tobacco users but also others who are exposed through secondhand and thirdhand tobacco smoke exposure. More than half of US children are regularly exposed to tobacco smoke. The vast majority of tobacco and nicotine dependence starts before 18 years. Effective tobacco control policies can decrease tobacco's toll on children's health.

This statement describes public policy recommendations to protect children from tobacco. Evidence quality is graded and recommendations generated as per Fig 1. An accompanying technical report describes the evidence to support these recommendations.¹ An accompanying policy statement describes clinical practice recommendations.²

DEFINITIONS

- Tobacco product: any nicotine delivery product, currently regulated or unregulated by the US Food and Drug Administration (FDA), which is not approved for safe and effective tobacco dependence treatment.

Evidence Quality	Preponderance of Benefit or Harm	Balance of Benefit and Harm
A. Well-designed RCTs or diagnostic studies on relevant population	Strong Recommendation	Option
B. RCTs or diagnostic studies with minor limitations; overwhelmingly consistent evidence from observational studies	Recommendation	
C. Observational studies (case-control and cohort design)		
D. Expert opinion, case reports, reasoning from first principles	Option	No Rec
X. Exceptional situations in which validating studies cannot be performed and there is a clear preponderance of benefit or harm	Strong Recommendation Recommendation	

FIGURE 1
Evidence quality. RCT, randomized controlled study.

- Secondhand smoke: the smoke emitted from a tobacco product that is inhaled by a nonuser.
- Thirdhand smoke: the tobacco smoke that is absorbed onto surfaces and exposes the nonuser by either direct contact and dermal absorption and/or off-gassing and inhalation. Thirdhand smoke may react with oxidants and other compounds in the environment to yield secondary pollutants.
- Involuntary tobacco smoke exposure: The tobacco smoke exposure of nonusers. Involuntary exposure includes both secondhand and thirdhand exposure.
- Electronic nicotine delivery systems: handheld devices that produce an aerosol from a solution typically containing nicotine, flavoring chemicals, and carrier solvents such as propylene glycol and vegetable glycerin (glycerol) for inhalation by the user. Alternate names for these products include electronic cigarettes, e-cigarettes, e-cigs, electronic cigars, e-cigars, electronic hookah, e-hookah, hookah sticks, personal vaporizers, mechanical mods, vape pens, and vaping devices.

NEW INFORMATION

Benefits to children's health of clean air legislation, including

comprehensive smoking bans, have been clearly documented.³ Children and adolescents are harmed by involuntary tobacco smoke exposure in vehicles,⁴ in multi-unit housing,^{5,6} and from outdoor smoking in congested areas.^{7,8} Among youth, the use of tobacco and nicotine products other than cigarettes (cigars, little cigars and cigarillos, hookahs, dip, chew, snus, electronic nicotine delivery systems, and others) is on the rise.⁹ Many adolescents who smoke cigarettes are dual or multiple users; that is, they use a combination of different tobacco products.¹⁰

BACKGROUND

Tobacco is unique among consumer products in that it causes disease and premature death when used exactly as intended. The 2014 US Surgeon General's Report concluded: "This year alone, nearly one-half million adults will still die prematurely because of smoking. If we continue on our current trajectory, 5.6 million children alive today who are younger than 18 years of age will die prematurely as a result of smoking."³ In the United States (2005–2009 data), nearly 1000 infant deaths per year, or approximately 8% of all infant deaths and 17% of all sudden infant death syndrome cases, are

attributable to tobacco smoking and tobacco smoke exposure.³

Tobacco smoke exposure harms children from conception forward, either causing or exacerbating the risks of preterm birth, low birth weight,¹¹ congenital malformations,¹² stillbirth, sudden infant death,^{13–16} childhood obesity,^{17–20} behavior problems, neurocognitive deficits,^{21,22} wheezing,^{23,24} more severe asthma,^{25–30} more severe bronchiolitis, pneumonia,³¹ middle ear infection, reduced lung function, cough,²⁴ and cancer.^{32,33} Emerging data point to secondhand tobacco smoke exposure not only as a risk factor for development of childhood cancers²⁴ but as a factor that may increase the likelihood of smoking among young adult cancer survivors.³⁴ Secondhand tobacco smoke exposure is also associated with decreased glomerular filtration rate³⁵ and preclinical atherosclerosis^{36,37} in adolescents. Recent research suggests that exposure to tobacco smoke can lead to symptoms of dependence in children who do not use tobacco.^{38,39} There is no safe level of tobacco smoke exposure.²⁴

Nearly 90% of tobacco-dependent adults initiated their tobacco use well before their 18th birthday.⁴⁰ The developing brains of children and adolescents are particularly vulnerable to nicotine. Although adolescent tobacco use in the United States has decreased substantially since the 1970s, it remains a considerable problem.

Electronic nicotine delivery systems are rapidly rising in popularity among youth and threaten to addict a new generation. The National Youth Tobacco Survey reported that from 2011 to 2014 current (within past 30 days) electronic cigarette use rose from 0.6% to 3.9% of middle school and 1.5% to 13.4% of high school students—increases of 650% and 890%, respectively.^{41,42} Electronic cigarette use among youth

TABLE 1 Tobacco Control Policy Resources

1. CDC Best Practices for Comprehensive Tobacco Control Programs—2014
Available for download at http://www.cdc.gov/tobacco/stateandcommunity/best_practices
This is an evidence-based guide to help states plan and establish effective tobacco control programs to prevent and reduce tobacco use. The guide describes an integrated programmatic structure for implementing interventions proven to be effective and provides levels of state investment to prevent and reduce tobacco use in each state. Recommended funding levels for tobacco control programs for each state in the US are described.
2. World Health Organization (WHO) Framework Convention on Tobacco Control
Available for download at <http://www.who.int/fctc/about/en>
The WHO Framework Convention on Tobacco Control was developed in response to the globalization of the tobacco epidemic. It aims to tackle some of the causes of that epidemic, including complex factors with cross-border effects, such as trade liberalization and direct foreign investment, tobacco advertising, promotion and sponsorship beyond national borders, and illicit trade in tobacco products.
3. World Health Organization MPOWER
<http://www.who.int/tobacco/mpower/en>
MPOWER measures, which correspond to ≥ 1 articles of the Framework Convention, assist in reducing the demand for tobacco products at country level. MPOWER components include the following:
Monitor tobacco use and prevention policies
Protect people from tobacco smoke
Offer help to quit tobacco use
Warn about the dangers of tobacco
Enforce bans on tobacco advertising, promotion, and sponsorship
Raise taxes on tobacco
4. Campaign for Tobacco Free Kids
<http://www.tobaccofreekids.org>
The Campaign for Tobacco Free Kids advocates for public policies proven to prevent kids from smoking, help smokers quit and protect everyone from secondhand smoke.
5. Truth Initiative
<http://www.truthinitiative.org>
Known previously as the American Legacy Foundation, Truth Initiative was established in 1999 as part of the Master Settlement Agreement (MSA) among the major tobacco companies, 46 US states, the District of Columbia, and 5 US territories. Truth Initiative is dedicated to studying and providing public education about the impact of tobacco to reduce its use and associated death and disease. Under the terms of the MSA, Truth Initiative is restricted from advocacy or lobbying. However, Truth Initiative may educate the public on the addictive nature of nicotine and the dangers of smoking.
6. American Lung Association
<http://www.lung.org/stop-smoking/tobacco-control-advocacy>
The American Lung Association (ALA) includes tobacco control advocacy as part of its mission. In addition to other activities, the ALA prepares an annual report, "The State of Tobacco Control," and grades each state in the United States on its tobacco control efforts. The ALA is a leading voluntary health organization focused on improving lung health and preventing lung disease through education, advocacy, and research. Eliminating tobacco use and tobacco-related lung disease is a key part of the mission of the ALA.
7. US Department of Housing and Urban Development (HUD) Smoke Free Multifamily Housing: HUD's Action Plan to Create Smoke-free Multifamily Housing
Available for download at <http://portal.hud.gov/hudportal/HUD?src=/smokefreetoolkits1>
The purpose of HUD's Action Guide is to encourage public housing authorities and owners/agents of subsidized or market rate multifamily housing to adopt smoke-free policies.
8. American Academy of Pediatrics Julius B. Richmond Center of Excellence
<http://www2.aap.org/richmondcenter>
The Richmond Center provides the education, training, and tools to protect children from the harmful effects of tobacco and secondhand tobacco smoke.

is associated with greater rates of progression to regular (combustible) tobacco use and decreased rates of smoking cessation.^{43,44}

Tobacco promotion is an important cause of tobacco use initiation and escalation among youth.⁴⁰ Although

television and radio advertising of tobacco have been prohibited in the United States since 1971, electronic nicotine delivery systems are now being aggressively promoted on broadcast media.⁴⁵ Tobacco products continue to be advertised in

magazines with a substantial proportion of youth readership.^{46,47}

Flavoring agents increase the appeal of tobacco products to youth.^{48,49} The tobacco industry is currently exploiting the looser regulation on noncigarette tobacco products to market fruit- and candy-flavored cigars, small cigars, and electronic nicotine delivery systems. Flavoring agents with local anesthetic properties, such as menthol, decrease the natural sensation of harshness of the tobacco smoke and make it easier to inhale the smoke deeply.^{50,51}

Multipronged legal and political efforts of the tobacco industry have hampered effective tobacco control efforts.⁵² The tobacco industry has vigorously fought efforts to alter the image of their product through political campaign contributions, lobbying, litigation, co-opting media to promote "reasonable doubt" about harms, using funds and influence to bias scientific research and communication, and diverting of resources from effective programs to ineffective ones.⁵³

Smoking rates have decreased in response to legislative and regulatory interventions including increasing taxes on tobacco products, restricting youth access to tobacco products, restriction of tobacco advertising, and clean air laws (including in workplaces, bars, restaurants, schools, child care facilities, parks, entertainment venues, and other public facilities) as well as interventions that changed the image of tobacco (such as release of the first Surgeon General's report,⁵⁴ the Truth campaign,^{55,56} and mass-media and antismoking campaigns).³

Effective public policy measures are essential to control the tobacco epidemic and protect children's health. The following are evidence-based policy recommendations that can reduce the incidence and prevalence of tobacco and nicotine

dependence among young people and reduce the harms of involuntary tobacco smoke exposure for children. Additional public policy resources are described in Table 1.

PUBLIC POLICY RECOMMENDATIONS

1. The FDA should regulate all tobacco products to protect the public health.

Recommendation Strength: Strong Recommendation

The FDA is charged with the mission of protecting consumers and enhancing public health by maximizing compliance of FDA-regulated products and minimizing risk associated with those products. The FDA Center for Tobacco Products oversees the implementation of the Family Smoking Prevention and Tobacco Control Act,⁵⁷ which was passed to protect the public and create a healthier future for all Americans.⁵⁸ Regulations, taxes, and restrictions on the sale and use of tobacco products should apply to all tobacco products. Noncigarette tobacco products should not be exempt from regulations and taxes that apply to cigarettes.

2. Tobacco control should be adequately funded.

Recommendation Strength: Strong Recommendation

Tobacco dependence treatment of tobacco-dependent individuals of all ages should be available. Funding mechanisms should include health insurance coverage, school- and workplace-financed programs, and publicly financed programs. Given the important benefits to society of reducing tobacco dependence, cost should not be a barrier to program participation and access to tobacco dependence treatment medications. Health care payers should provide coverage for tobacco dependence treatment without cost sharing. Telephonic tobacco dependence counseling and treatment (such as 1-800-QUIT-NOW) is effective and should be promoted and fully funded

as described in the Centers for Disease Control and Prevention (CDC)'s Best Practices for Comprehensive Tobacco Control Programs.⁵⁹ The Best Practices recommendations should be implemented with funding at or near recommended levels. As of 2014, only 2 states (Alaska and North Dakota) funded tobacco control efforts at or near CDC-recommended levels.⁶⁰

Tobacco control research should be considered a high priority and funded accordingly from both government and private sources. Research priorities should include the effects of tobacco and nicotine exposure on children and adolescents starting with in utero exposure and continuing through children's growth and development. Research to improve approaches to adolescent tobacco dependence treatment is urgently needed. Researchers, academic medical institutions, and other health care institutions should not accept funding from the tobacco industry for tobacco control programs or research.⁶¹

RECOMMENDATIONS FOR PUBLIC POLICY TO PROTECT CHILDREN FROM TOBACCO USE INITIATION

3. Tobacco product advertising and promotion in forms that are accessible to children and youth should be prohibited.

Recommendation Strength: Strong Recommendation

The tobacco industry promotes their product by associating the product with images of glamour, success, individuality, virility, coolness, style, slimness, camaraderie, self-confidence, freedom, independence, pleasure, relaxation, social acceptability, and an escape from daily stresses.⁶² These images disguise the true reality of addiction, illness, disability, disfigurement, and premature death that tobacco products cause.

4. Point-of-sale tobacco product advertising and product placement that can be viewed by children should be prohibited.

Recommendation Strength: Strong Recommendation

Point-of-sale tobacco product advertising and product placement that can be viewed by children should be prohibited by state and/or local regulations. Until these restrictions are adopted by governments, business owners should adopt them voluntarily. Point-of-sale advertising increases tobacco initiation and tobacco product use among youth. Tobacco products, advertisements, logos, including vintage advertisements, should not be potentially visible to children or adolescents in or near retail establishments. Tobacco products should be placed out of sight, rather than in displays that can be seen by a child passing by, essentially functioning as point-of-sale advertising to children.⁶³ Tobacco companies should be prohibited from providing materials or incentives for point-of-sale advertising.

5. Depictions of tobacco products in movies and other media that can be viewed by youth should be restricted.

Recommendation Strength: Strong Recommendation

Depictions of tobacco products, tobacco product use, and images associated with tobacco product brands in movies and video games should be restricted. Movies with depictions of any tobacco product use should be given a minimum of an R rating. Movies, videos, video games, and other entertainment media with depictions of tobacco product use should be preceded by strong messages that tell the truth about the harms of tobacco in a manner that is personally relevant to the target audience. These messages should not be funded or otherwise supported or produced by the tobacco industry. These policies should be put in place

voluntarily by the industry; however, should this not be accomplished voluntarily, local, state, and federal government regulations should be adopted to regulate tobacco promotion in media available to children and youth. Tax subsidies should be eliminated for film and to productions in which characters use tobacco products or tobacco products are otherwise depicted. The tobacco industry should not fund or otherwise support tobacco product placement in any media. Media companies and individuals involved in media production (including Internet and social media) should not accept anything in exchange—either implicitly or explicitly—for display of tobacco products. Celebrities should not use their privileged position to model tobacco product use, including electronic nicotine delivery systems and other existing or emerging tobacco products. Film, video game, or other visual media depicting tobacco use or displaying images of tobacco products should contain a prominently displayed declaration as to the presence or absence of direct or indirect tobacco industry support. There should be no sponsorship of events, such as sporting, cultural, or entertainment events, by the tobacco industry or any tobacco manufacturer, vendor, or brand as this functions as advertising that is accessible to children.

6. The promotion and sale of electronic nicotine delivery systems to youth should be prohibited.

Recommendation Strength: Strong Recommendation

The promotion and sale of electronic nicotine delivery systems to youth should be prohibited by federal, state, and local regulations. Prohibitions on promotion should include all media that can be viewed by youth, including broadcast, print, and electronic (Web- or Internet-based) media. Prohibitions on promotion

should include prohibitions on sponsorships, such as sports, cultural event, and entertainment sponsorships. Any promotional activities that can be accessed by children and/or adolescents should be considered promoting to children. Electronic nicotine delivery systems should be subject to the same restrictions on advertising and promotion at least as restrictive as that on combustible cigarettes. Until government agencies institute these prohibitions, media companies, entertainment companies, sports teams, and promoters should voluntarily institute these prohibitions.

7. Tobacco control programs should change the image of tobacco by telling the truth about tobacco.

Recommendation Strength: Strong Recommendation

Tobacco control programs should change the image of tobacco by telling the truth about tobacco. The tobacco industry should be excluded from development and implementation of tobacco education and control programs. The tobacco industry has a long track record of promoting programs that have been shown to be both ineffective and counterproductive.⁶² The tobacco industry has been particularly hostile to programs that tell the truth and threaten the image of their product.

Low-income, lesbian/gay/bisexual/transgender, and American Indian/Alaska Native youth shoulder a substantially greater burden of tobacco and nicotine dependence.^{64–66} These communities require dedicated resources and more intensive tobacco control efforts.

Media campaigns are an important part of tobacco control efforts. Messages should be tailored to the target population and result in knowledge, attitude, and behavior change. Media campaigns should have sufficient reach, frequency, and

duration to be successful. Messages should elicit strong emotional response, such as personal testimonials, viscerally negative content, and direct confrontation of the tobacco industry's marketing tactics.

Federal legislation should be passed requiring pictorial health warnings that tell the truth about the effects of tobacco. Pictorial health warnings that tell the truth about the effects of tobacco improve awareness and decrease social appeal of smoking in adolescents.^{67,68}

8. Tobacco product prices should be increased to reduce youth tobacco use initiation.

Recommendation Strength: Strong Recommendation

Tobacco product prices should be increased to reduce youth tobacco use initiation.⁶⁹ This can be accomplished by mandating a minimum package size for purchase and through increases in tobacco taxes. These changes can be implemented by federal, state, and local governments. Taxation by one government entity should not restrict or impair the ability of other government entities to impose additional taxes on tobacco products. There should not be loopholes in which some tobacco products are regulated and taxed less stringently than others. Tax rates should escalate with inflation. Free samples of tobacco products, along with coupons, discounts, and rebates should be banned. Internet sales of tobacco products should be banned; Internet sales can be easily accessed by minors and can be used to evade local tobacco control regulations and taxes.⁷⁰

To decrease risk of illicit trade, tobacco taxes should be collected on production. Laws and regulations against illicit trade in tobacco products should be aggressively enforced. By circumventing tobacco taxes and restrictions on tobacco

sales, illicit trade in tobacco products harms children.⁷⁰

9. The minimum age to purchase tobacco should be increased to 21 years.

Recommendation Strength: Strong Recommendation

The minimum age to purchase tobacco should be increased to 21 years. Laws and regulations prohibiting the sale of tobacco to minors should be vigorously enforced. Legislation to increase the minimum age of purchase can be implemented at the state and local government levels. Funding for enforcement activities can be provided from federal, state, or local revenues. Middle and high school students often obtain their first tobacco products from older children.⁷¹ Because the vast majority of people who become tobacco dependent do so before 21 years of age, increasing the minimum age of purchase from 18 to 21 years and enforcing this regulation will protect a larger proportion of the population from becoming tobacco dependent.

Enforcement activities that disrupt the commercial distribution of tobacco to minors are consistently associated with reductions in youth smoking rates.⁷²

10. Flavoring agents, including menthol, should be prohibited in all tobacco products.

Recommendation Strength: Strong Recommendation

Flavoring agents, including menthol, cloves, fruit, and candy flavors, should be prohibited in tobacco products. Flavoring agents increase the appeal of tobacco products to youth.^{48,49} Tobacco use initiation and progression to dependence are more common with use of the flavored products. Menthol flavoring is particularly hazardous to children. Youth who initiate smoking with a menthol-flavored tobacco product are more likely to progress to

dependence and to report higher levels of dependence.^{73,74}

RECOMMENDATIONS TO PROTECT CHILDREN FROM TOBACCO SMOKE AND NICOTINE EXPOSURE

11. Comprehensive smoking bans should be enacted.

Recommendation Strength: Strong Recommendation

A comprehensive ban on tobacco product use prevents not only exposure of children to tobacco product emissions but also exposure to modeling of tobacco product use and nicotine consumption behavior. These policies should be put in place by state and local governments, and where governments have failed to enact these policies, business owners should take it upon themselves to implement them in the facilities that they control.

Smoking and use of tobacco products that produce an emission should be prohibited in all workplaces, including bars, restaurants, and health care facilities. Smoking and use of tobacco products that produce an emission should be banned in outdoor areas frequented by children, including sidewalks, recreational and sports facilities, entertainment venues, and parks.

Smoking and use of tobacco products (including those that do not produce an emission) should be prohibited on campuses where children are cared for, educated, work, and play. This includes child care facilities, schools, health care facilities, dormitories, entertainment venues, parks and athletic facilities, shopping, restaurants, and leisure facilities.

Smoke-free homes and smoke-free motor vehicles should be promoted. Smoking in a motor vehicle exposes children to high concentrations of tobacco smoke.⁴ Prohibitions on smoking in motor vehicles with children present can be addressed through both educational and legislative interventions. Smoke-free

homes can be promoted through public education campaigns.

The ceremonial use of tobacco among American Indian and Alaska Native people should be respected. Traditional ceremonial uses of tobacco do not include smoking cigarettes, the ingestion of smokeless tobacco, the use of electronic nicotine delivery systems, or the use of other commercial tobacco products.

12. Smoking in multi-unit housing should be prohibited.

Recommendation Strength: Strong Recommendation

Regulations prohibiting smoking in multi-unit housing should be adopted by state and local governments. Federal, state, and local housing authorities and owners of multi-unit housing facilities should prohibit smoking in their facilities. Smoking in one unit involuntarily exposes those in nearby units.^{5,75,76} Besides protecting the health of the children, prohibitions on smoking protects their investment from damage by tobacco smoke and tobacco smoking caused fires.

13. Prohibitions on smoking and use of tobacco products should include prohibitions on use of electronic nicotine delivery systems.

Recommendation Strength: Strong Recommendation

The vapor emitted from electronic nicotine delivery systems contains toxic and carcinogenic substances in addition to nicotine. Use of these products involuntarily exposes others to these hazardous substances.^{77,78}

RECOMMENDATIONS TO PROTECT CHILDREN FROM ACUTE NICOTINE POISONING

14. Children younger than 18 years should be legally prohibited from working on tobacco farms and in tobacco production.

Recommendation Strength: Strong Recommendation

State and local governments should prohibit children under 18 years from working on tobacco farms or in tobacco production. Tobacco producers should not employ children under 18 years. Companies that produce and market tobacco products should not obtain supply from tobacco growers that allow children under 18 years to work in tobacco production. Nicotine poisoning, referred to as “green tobacco sickness” is a unique hazard of tobacco farming. It is caused by contact with leaves of the tobacco plant leading to dermal nicotine absorption. The quantity of nicotine absorbed can be enough to cause severe symptoms including weakness, headache, nausea, vomiting, dizziness, abdominal cramps, breathing difficulty, pallor, diarrhea, chills, fluctuations in blood pressure or heart rate, increased perspiration, excessive salivation, and seizures.⁷⁹ There have been multiple reports of severe green tobacco sickness in children.⁸⁰

15. Concentrated nicotine solution for electronic nicotine delivery systems should be sold in child-resistant containers with amounts limited to that which would not be lethal to a young child if ingested.

Recommendation Strength: Strong Recommendation

Federal, state, and local governments should require that concentrated nicotine solutions for use by consumers in electronic nicotine delivery systems be packaged in child-resistant containers with amounts limited to that which would not be lethal to a young child if ingested. Until such time as these regulatory requirements are put in place, manufacturers and vendors should voluntarily comply with this recommendation. One child has died of the ingestion of nicotine-containing electronic nicotine delivery systems solution.⁸¹

CONCLUSIONS

Tobacco is unique among consumer products in that it severely injures and kills when used exactly as intended. Children are harmed from tobacco product use and tobacco smoke exposure. Protecting children from tobacco products is one of the most important things that a society can do to protect children’s health. Effective public policy interventions to reduce the incidence of tobacco and nicotine dependence among children and to reduce children’s tobacco smoke exposure have been documented. It is imperative that policy makers at the international, national, state, and local levels allocate resources and take action.

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ABBREVIATIONS

CDC: Centers for Disease Control and Prevention
FDA: US Food and Drug Administration

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