



Policy Position on Smoke-Free Policies in Multi-Unit Housing (June 2013)

POSITION

The American Heart Association has long advocated for strong public health measures that will reduce the use of tobacco products in the United States and limit exposure to secondhand smoke. The various policies prioritized by the Association and its national partners include adequate funding for tobacco cessation and prevention programs, comprehensive smoke-free air laws, taxation of tobacco products, and FDA regulation of tobacco. As states and localities accomplish each of these policy priorities, they are increasingly looking for other policy strategies to address the impact of tobacco use on health. Smoke-free policies in multi-unit housing are emerging as an important strategy to address smoking and exposure to tobacco smoke in homes where children, adolescents, the elderly and the disabled are especially vulnerable. Research has shown that smoke-free policies in the home reduce second-hand smoke exposure for all residents, can increase cessation among smokers, and can decrease relapse in former smokers.^{1,2,3,4,5}

Accordingly, the American Heart Association supports comprehensive smoke-free policies in multi-unit housing. In public housing, these policies could be mandated as part of regulation since taxpayer dollars are used to subsidize the health and economic consequences of smoking. In privately-owned housing, legislation or regulation could provide incentives to owners such as insurance discounts, or funding for education, communication, and cessation resources as motivation to adopt comprehensive smoke-free policies. While advocating for comprehensive smoke-free policies, the American Heart Association wants to assure that smokers are not denied access to public housing as they can abide by policies which allow for outdoor smoking areas.

BACKGROUND

Multi-Unit Housing and Exposure to Second-hand Smoke

About 40 million Americans live in multi-unit housing properties (apartments, condominiums, and townhouses), representing 31.5% of all housing units in the United States.⁶ Recent federal government data show that approximately 7.1 million Americans live in subsidized housing.⁷ Of these individuals, about 2.1 million live in public housing where the housing is owned or operated by a Housing Authority.⁶ Determining public and subsidized housing can be complex as ownership and administration is often decentralized and fragmented between the federal government and local public housing authorities.⁸ For example, there are publicly-owned and subsidized apartment buildings and there are voucher programs for privately owned properties where tenants receive a subsidy from the federal government to help cover their private housing rent. Additionally, states offer supplemental public housing programs that operate without federal funding. Despite the complexity, in each of these cases, at least some tax dollars are being used to subsidize all or a portion of the housing costs.

Surveillance data show that the smoking rate is higher in subsidized housing where 32.7% of adults use tobacco compared with 20.6% in the general population.^{9,10} As more states and localities have passed smoke-free air laws for public spaces and workplaces, the home is the most significant source of exposure to second-hand smoke, especially for children.¹¹ Americans on average, spend about two thirds of their time each day in their residences.¹² However, only half of U.S. households with both children and smokers have complete home smoking bans and

unfortunately bans are less common among smoking families with older children, in African-American and Hispanic households, and in households in states where there is a higher smoking prevalence.¹³

Even if people living in multi-unit housing have a smoke-free policy for their own home, they may still suffer incursions from others in the complex. Research has documented the transfer of second-hand smoke in the air^{14,15,16,17,18,19,20} and transfer of second-hand smoke constituents through heating, ventilation, air conditioning systems and other connections between units.^{6,21,22,23} As many as half of multi-unit housing residents report that smoke has entered their unit from elsewhere in the building or complex^{24,25} and detectable levels of nicotine have been documented in multi-unit buildings where smoking is permitted.^{26,27,28}

In 2009, the U.S. Department of Housing and Urban Development encouraged smoke-free policies in public housing to prevent the migration of second-hand smoke between housing units in an attempt to lower exposure especially among the most vulnerable tenants including the elderly, children, and people with chronic illnesses.²⁹ In public housing, children and adolescents are 39 percent of residents while older Americans comprise 15 percent of residents.³⁰ There is evidence that exposure to second-hand smoke disproportionately affects minorities,^{31,32} women, and those in lower socioeconomic groups since a larger number of these individuals are residing in subsidized housing and blue collar workers are less likely than white collar workers to be covered by smoke-free policies in their workplaces.³

Impact on Health

Cigarette smoking remains the leading cause of preventable morbidity and premature death in the United States.³³ Each year, approximately 467,000 persons in the U.S. die prematurely as a result of smoking and 49,000 from exposure to secondhand smoke.³⁴ Second-hand smoke is a carcinogen to children and adults who do not smoke³⁵ and produces immediate adverse effects on heart function, blood platelets, inflammation, endothelial function and the vascular system.³⁶ Additionally, increasing exposure to second-hand smoke, such as that experienced with chronic exposure in the home, amplifies the negative health impact. More than 88 million non-smokers over the age of 3 are exposed to second-hand smoke in the United States.³⁷

Studies on the health impact of second-hand smoke are robust. No level of second-hand smoke exposure is safe.³⁸ In 2009 the Institute of Medicine assessed the state of the science on the suggested causal relationship between secondhand smoke exposure and heart attacks. The IOM report³⁹ explored in a comprehensive way the strengths and weaknesses of population-based studies, the pathophysiology of secondhand smoke exposure and myocardial infarction, knowledge gaps, and strength of the relationship between low exposure and heart attack incidence. On the basis of its review of the available experimental and epidemiologic literature, including relevant studies on air pollution and particulate matter, the IOM concluded that there is a causal relationship between smoking bans and decreases in acute coronary events. However, the report did not estimate the effect size or magnitude of the impact. Studies from around the world have now provided evidence for the reduced incidence of heart attacks after implementation of smoke-free air policies.^{40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55}

Other health effects of exposure to second-hand smoke include dementia in adults⁵⁶ and impairment on cognitive function and the ability to perform mental tasks.³⁸ In infants and children, second-hand smoke is a risk factor for heightened asthma attacks, acute respiratory illness, Sudden Infant Death Syndrome, and ear infections.³⁸ Pregnant women exposed to second-hand smoke show a greater risk of giving birth to low-birth-weight babies.³⁸

Estimates are that exposure to second-hand smoke causes 21,800-75,100 coronary heart disease deaths a year and 38,100-128,900 heart attacks annually.⁵⁷ Long-term exposure to second-hand smoke, such as that occurring in a home or the workplace, is associated with a 25%–30% increased risk for coronary heart disease in adult nonsmokers.⁵⁸

The Economics of Smoke-Free Multi-Unit Housing

The health care costs associated with disease incidence caused by second-hand smoke exposure are estimated at \$1.8-6.0 billion.³⁸ If recent trends in the reduction in the prevalence of second-hand smoke exposure continue, the health and economic burden in the U.S. would be reduced by approximately 25%–30%.¹⁰ This potential reduction has important ramifications for lowering Medicare, Medicaid, and private insurance costs.

One recent study⁵⁹ estimated the annual cost-savings associated with smoke-free policies in multi-unit housing by calculating savings for second-hand smoke related health care costs, renovations of housing units that permit smoking, and smoking-attributed fires. Renovations or repairs include paint to cover smoke stains, cleaning of ducts, replacing stained window fixtures, and replacing carpets. The calculations from this study showed that prohibiting smoking in all U.S. subsidized housing could save approximately \$521 million per year, including \$341 million in second-hand smoke-related health care expenditures, \$108 million in renovation expenses, and \$72 million in smoking-attributable fire losses. Just prohibiting smoking in public housing alone would save approximately \$154 million annually. Another study of multi-unit housing owners in California showed that comprehensive smoke-free policies implemented statewide could save owners over \$18 million a year.⁶⁰ Clearly there are economic motivations for smoke-free policies that go beyond the critically important health benefits.

Residents' Acceptance of Smoke-Free Policies

Several studies have reviewed whether tenants support smoke-free policies in multi-unit housing. Generally, former smokers, non-smokers, ethnic minorities, and those living with children support these policies specifically for improved health, fire safety, and building cleanliness.^{61,62,63,64} A clear majority of tenants report having a smoke-free policy in their own homes, but as already mentioned, these residents experience incursions of second-hand smoke from other tenants and for almost 10% of residents, that incursion is daily.⁶⁵ Current smokers are less supportive of smoke-free policies and can be non-compliant.⁶ It is important that there is acceptance and buy-in from all tenants with implementation of any smoke-free policies to minimize enforcement issues and maximize the health benefits. Use of messaging on the communal impact of smoking as well as readily available cessation services can help facilitate acceptance.

Multi-Unit Housing Owners' Acceptance

Landlords, public authorities, or owners of multi-unit housing are more skeptical of instituting smoke-free policies due to concerns about enforcement, tenant objections, loss of market share, vacancy, and turnover.⁶ However, only a small percentage of owners who have actually implemented smoke-free policies report increased vacancy and turnover.⁶ So there is some inconsistency in what is expected to happen versus the actual response, perhaps because of less availability of other housing options for low income tenants. Studies show greater adoption of smoke-free policies in higher income housing units. In surveys, owners who had not yet implemented smoke-free policies showed some interest in learning more about how to implement them.⁶ There is also some indication that owners would be motivated by economic incentives such as insurance discounts and subsidies to promote advertising of smoke-free buildings.⁶⁶

Research shows that comprehensive smoke-free policies are still relatively uncommon in multi-unit housing and many landlords do not perceive a demand. This may be because tenants do not feel there is opportunity to ask for these policies. There is also some indication that landlords need further education about the capacity for second-hand smoke to pass between units and expose non-smoking tenants as well as the financial advantages of adopting smoke-free policies.⁶⁷ Several activities can move owners/landlords along toward adopting smoke-free policies (see Appendix A) and cost-effective media strategies have been developed to educate tenants and owners about the advantages of adopting comprehensive smoke-free policies.⁶⁸

One of the most difficult challenges for implementing a comprehensive smoke-free policy, especially in public housing, is enforcement.⁶⁹ Monitoring and compliance reporting mechanisms have to be established with sanctions for noncompliance. Threatening eviction is especially difficult in public housing where the fundamental tenet is to protect against homelessness for vulnerable populations. However, enforcement policies for a smoke-free policy would be very much like holding tenants accountable for other rules like sanitation or pet ownership where enforcement and monitoring may already be in place.

Additionally, landlords and housing authorities can actually reduce their legal liability by restricting or banning smoking since there are liability concerns for exposing their non-smoking tenants to second-hand smoke.^{70, 71} The Federal Fair Housing Act of 1992, the Americans with Disabilities Act, the Rehabilitation Act, and state disability discrimination laws provide protection against housing discrimination for people with disabilities, including those with sensitivities to tobacco smoke.⁷⁰ There is currently no state or federal law that prohibits multi-unit housing operators from implementing smoke-free policies.⁷² Smokers do not have a “right to smoke” and smokers are not a protected class under the fair housing laws.

Voluntary vs. Mandatory Implementation

Although, still relatively less common, smoke-free policies in multi-unit housing (public and private) are gaining momentum and can be approached either voluntarily or in a mandatory way. Following the U.S. Department of Housing and Urban Development’s recommendation in 2009, more states, localities, and local housing authorities began to consider smoke-free policies. For example, at the beginning of January 2005, seventeen public housing authorities in six states had smoke-free policies for some or all of their buildings but by February 2010, this number had increased to 141 local housing authorities in twenty states.⁷³ More than 50 public housing authorities in Minnesota developed smoke-free policies and several cities and counties in California required smoke-free policies in public multi-unit housing.⁷⁴ A multi-year campaign around voluntary adoption in Oregon led to a 29% increase in the availability of smoke-free rental units in the Portland-Vancouver metro area for private and public multi-unit housing owners.⁷⁵ Additionally, there is evidence that as broader clean indoor air laws for public places are adopted, there is increased implementation of smoke-free policies in multi-unit housing because shifting social norms are driving continued policy change.⁷⁶

As momentum grows, homeowner associations, landlords, or housing authorities seeking to implement smoke-free policy should consider several factors: support within the resident community, how the policy should be implemented, how comprehensive it should be, how to handle new tenants versus those who have been living in the complex for some time, procedures for adopting the policy and communicating it to tenants, costs associated with implementation, enforcement, any potential legal challenges, and impact on resale.

At the federal level, the Department of Housing and Urban Development has at least three options to address smoke-free policy in subsidized housing (see Appendix B for more thorough explanation of these options with ramifications): take no regulatory action and let public housing authorities regulate smoking policies on their own,

specifically include tobacco smoke in existing air quality requirements (which would mean that in order to comply with federal regulation, most housing authorities would have to address second-hand smoke exposure), and provide conditions for full funding that require federally-funded public housing to phase in 100% smoke-free policies.⁷⁷

Conclusion

Studies show that second-hand smoke transfer in multi-unit housing is common, the current prevalence of policies is low (even though there is growing momentum), and a clear majority of tenants in multi-unit housing would choose a smoke-free building over housing where smoking is permitted if other amenities are equal. Additionally, property managers who adopt no-smoking policies indicate that they are likely to continue doing so.⁷⁸ No level of second-hand smoke exposure is safe.

Whether adopted on a voluntary basis in housing units that are privately owned or mandated in housing units that are subsidized by public funding, there are clear health, economic, and legal benefits for tenants and owners. Public policy can also drive smoke-free policies in private housing by offering incentives or resources to owners who implement them. Policies should prohibit smoking in all new and existing residences that share walls or common areas and outdoor common areas should be smoke-free except for designated smoking areas. The American Heart Association supports comprehensive smoke-free policies in all multi-unit housing.

References:

¹ Hyland A, Higbee C, Travers MJ, et al. Smoke-free homes and smoking cessation and relapse in a longitudinal population of adults. *Nicotine Tob Res.* 2009; 11(6):614–618.

² Mills A, Messer K, Gilpin E, Pierce J. The effect of smoke-free homes on adult smoking behavior: a review. *Nicotine Tob Res.* 2009; 11(1):1131–1141.

³ King, B. A., Mahoney, M. C., Cummings, K. M., & Hyland, A. J. Intervention to promote smoke-free policies among multiunit housing operators. *Journal of public health management and practice: JPHMP.* 2011. 17(3), E1.

⁴ Pizacni BA, Maher JE, Rohde K, et al. Impact of a No-Smoking Policy in Public Housing Apartments. *Journal of Clinical Outcomes Measurement,* 2012. 19(6): 245-50.

⁵ Pizacani, B. A., Maher, J. E., Rohde, K., Drach, L., & Stark, M. J. Implementation of a smoke-free policy in subsidized multiunit housing: effects on smoking cessation and secondhand smoke exposure. *Nicotine & Tobacco Research,* 2012. 14(9), 1027-1034.

⁶ Cramer ME, Roberts S, Stevens E. Landlord attitudes and behaviors regarding smoke-free policies: implications for voluntary policy change. *Public Health Nurse,* 2011. 28(1):3–12.

⁷ U.S. Department of Housing and Urban Development. Resident characteristic report as of March 31, 2012. <https://pic.hud.gov/pic/RCRPublic/rcrmain.asp>.

⁸ Winickoff, J., Gottlieb, M., & Mello, M. M. Indoor Smoking Regulations in Public Housing. *NEJM,* 2010. 362(24), 2319.

⁹ CDC. National Health Interview Survey. 2009 data release. www.cdc.gov/nchs/nhis/nhis_2009_data_release.htm.

¹⁰ CDC. Vital signs: current cigarette smoking among adults aged 18 years—U.S., 2009. *Morbidity and Mortality Weekly Report* 2010;59(35):1135–40.

-
- ¹¹ Wilson, K. M., Klein, J. D., Blumkin, A. K., Gottlieb, M., & Winickoff, J. P. Tobacco-smoke exposure in children who live in multiunit housing. 2011. *Pediatrics*, 127(1), 85-92.
- ¹² Klepeis NE, Nelson WC, Ott WR, et al. The National Human Activity Pattern Survey (NHAPS): a resource for assessing exposure to environmental pollutants. *J Expo Anal Environ Epidemiol* 2001;11(3):231–52.
- ¹³ Mills, A. L., White, M. M., Pierce, J. P., & Messer, K. (2011). Home smoking bans among US households with children and smokers: opportunities for intervention. *American Journal of Preventive Medicine*, 41(6), 559-565.
- ¹⁴ Bohac DL, Hewett MJ, Hammond SK, Grimsrud DT. Secondhand smoke transfer and reductions by air sealing and ventilation in multiunit buildings: PFT and nicotine verification. *Indoor Air* 2011; 21(1):36–44.
- ¹⁵ Francisco P, Palmiter L. Infiltration and ventilation measurements on three electrically-heated multifamily buildings. Proceedings of the 1994 ACEEE Summer Study on Energy Efficiency in Buildings. Washington DC: American Council for an Energy Efficient Economy, 1994:5.97–5.104.
- ¹⁶ Harrje DT, Bohac DL, Feuerman D. Extended testing of a multifamily building using constant concentration and PFT methods. Proceedings of the 9th AIVC Conference; 1988; Ghent, Belgium. Sint-Stevens-Woluwe, Belgium: Air Infiltration and Ventilation Center, 1988: 193–212. www.inive.org/members_area/medias/pdf/Conf%5C1988%5CHarrje.pdf.
- ¹⁷ Feustel HE, Diamond RC. Diagnostics and measurements of infiltration and ventilation systems in high-rise apartment buildings. Proceedings of the 1996 ACEEE Summer Study on Energy Efficiency in Buildings. Washington DC: American Council for an Energy Efficient Economy, 1996:1.95–1.101.
- ¹⁸ Levin P. Air leakage between apartments. Proceedings of the 9th AIVC Conference, 1988; Ghent, Belgium. Sint-Stevens-Woluwe, Belgium: Air Infiltration and Ventilation Center, 1988:251– 63. www.inive.org/members_area/medias/pdf/Conf%5C1986%5CDiamond.pdf.
- ¹⁹ Modera MP, Diamond RC, Brunsell JT. Improving diagnostics and energy analysis for multifamily buildings: a case study. Berkeley CA: Lawrence Berkeley National Laboratory, 1986. Report No.: LBL-20247.
- ²⁰ Diamond RC, Modera MP, Feustel HE. Ventilation and occupant behavior in two apartment buildings. Proceedings of the 7th AIVC Conference; 1986; Stratford-upon-Avon, UK. Sint-Stevens-Woluwe, Belgium: Air Infiltration and Ventilation Center, 1988:6.1– 6.18. www.aivc.org/frameset/frameset.html?./Conferences/conferences.html_mainFrame.
- ²¹ Kraev TA, Adamkiewicz G, Hammond SK, Spengler JD. Indoor concentrations of nicotine in low-income, multi-unit housing: associations with smoking behaviours and housing characteristics. *Tob Control* 2009;18:438–44.
- ²² King BA, Travers MF, Cummings KM, Mahoney MC, Hyland AJ. Secondhand smoke transfer in multiunit housing. *Nicotine Tob Res* 2010;12(11):1133– 41.
- ²³ Hewett, M. J., Ortland, W. H., Brock, B. E., & Heim, C. J. (2012). Secondhand smoke and smokefree policies in owner-occupied multi-unit housing. *American Journal of Preventive Medicine*, 43(5), S187-S196.
- ²⁴ Hennrikus, D., Pentel, P., & Sandell, S. Preferences and practices among renters regarding smoking restrictions in apartment buildings. *Tobacco Control*, 2003. 12, 189–194.
- ²⁵ Hewett, M., Sandell, S., Anderson, J., & Niebuhr, M. Secondhand smoke in apartment buildings: Renter and owner or manager perspectives. *Nicotine & Tobacco Research*, 2007. 9(Suppl. 1), S39–S47.
- ²⁶ King, B. A., Travers, M. J., Cummings, K. M., Mahoney, M. C., & Hyland, A. J. Prevalence and predictors of smoke-free policy implementation and support among owners and managers of multiunit housing. *Nicotine & tobacco research*, 2010. 12(2), 159-163.

-
- ²⁷ Hood, N. E., Ferketich, A. K., Klein, E. G., Pirie, P., & Wewers, M. E. Associations between self-reported in-home smoking behaviours and surface nicotine concentrations in multiunit subsidised housing. *Tobacco control*. 2012; 0:1–6.
- ²⁸ Matt, G. E., Quintana, P. J., Zakarian, J. M., Fortmann, A. L., Chatfield, D. A., Hoh, E., et al., . When smokers move out and non-smokers move in: residential thirdhand smoke pollution and exposure. *Tobacco Control*, 2011. 20(1), e1-e1.
- ²⁹ Drach, L. L., Pizacani, B. A., Rohde, K. L., & Schubert, S. The acceptability of comprehensive smoke-free policies to low-income tenants in subsidized housing. *Preventing chronic disease*, 2010. 7(3).
- ³⁰ U.S. Department of Housing and Urban Development. Non-smoking policies in public housing. Notice PIH-2009-21 (HA). July 17, 2009. www.hud.gov/offices/pih/publications/notices/09/pih2009-21.pdf.
- ³¹ Blake SM. Murray KD. El-Khorazaty N. Gantz MG. Kiely M. Best D. Joseph JG. El-Mohandes A.E. Environmental tobacco smoke avoidance among pregnant African-American nonsmokers. *American Journal of Preventive Medicine*. March 2009. 36(3).
- ³² Cook DM, Lee WL, Yang W. Factors associated with total restrictions on smoking at work and at home: a study among populations in multiple US states and the US Virgin Islands. *Int J Occup Environ Health*. 2009;15:392–401.
- ³³ Go A, et al. Heart Disease and Stroke Statistics 2013 Update: A Report from the American Heart Association. *Circulation*. Published online December 12, 2012.
- ³⁴ Centers for Disease Control and Prevention. Smoking-Attributed Mortality, Years of Potential Life Lost and Productivity Losses – United States, 2000-2004. *Morbidity and Mortality Weekly Report*. November 14, 2008.
- ³⁵ U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General—Executive Summary*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.
- ³⁶ Dinno A. Clean indoor air laws immediately reduce heart attacks. *Preventive Medicine*. 2007; 45: 9–11.
- ³⁷ CDC. Vital signs: nonsmokers' exposure to secondhand smoke—U.S., 1999–2008. *MMWR Morb Mortal Wkly Rep* 2010;59(35):1141–6.
- ³⁸ U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General—Executive Summary*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.
- ³⁹ Secondhand smoke exposure and cardiovascular effects: making sense of the evidence. Committee on Secondhand Smoke Exposure and Acute Coronary Events. Board on Population Health and Public Health Practice. Institute of Medicine. October 15, 2009. Washington, DC
- ⁴⁰ Glantz S. Meta-analysis of the effects of smokefree laws on acute myocardial infarction: an update. *Preventive Medicine*. 2008. 47: 452–453.
- ⁴¹ Centers for Disease Control and Prevention. Reduced hospitalizations for acute myocardial infarction after implementation of a smoke-free ordinance – city of Pueblo, Colorado, 2002-2006. *Morbidity and Mortality Weekly Report*. January 2, 2009. 57(51&52)
- ⁴² Glantz S. Meta-analysis of the effects of smokefree laws on acute myocardial infarction: an update. *Preventive Medicine*. 2008. 47: 452–453.

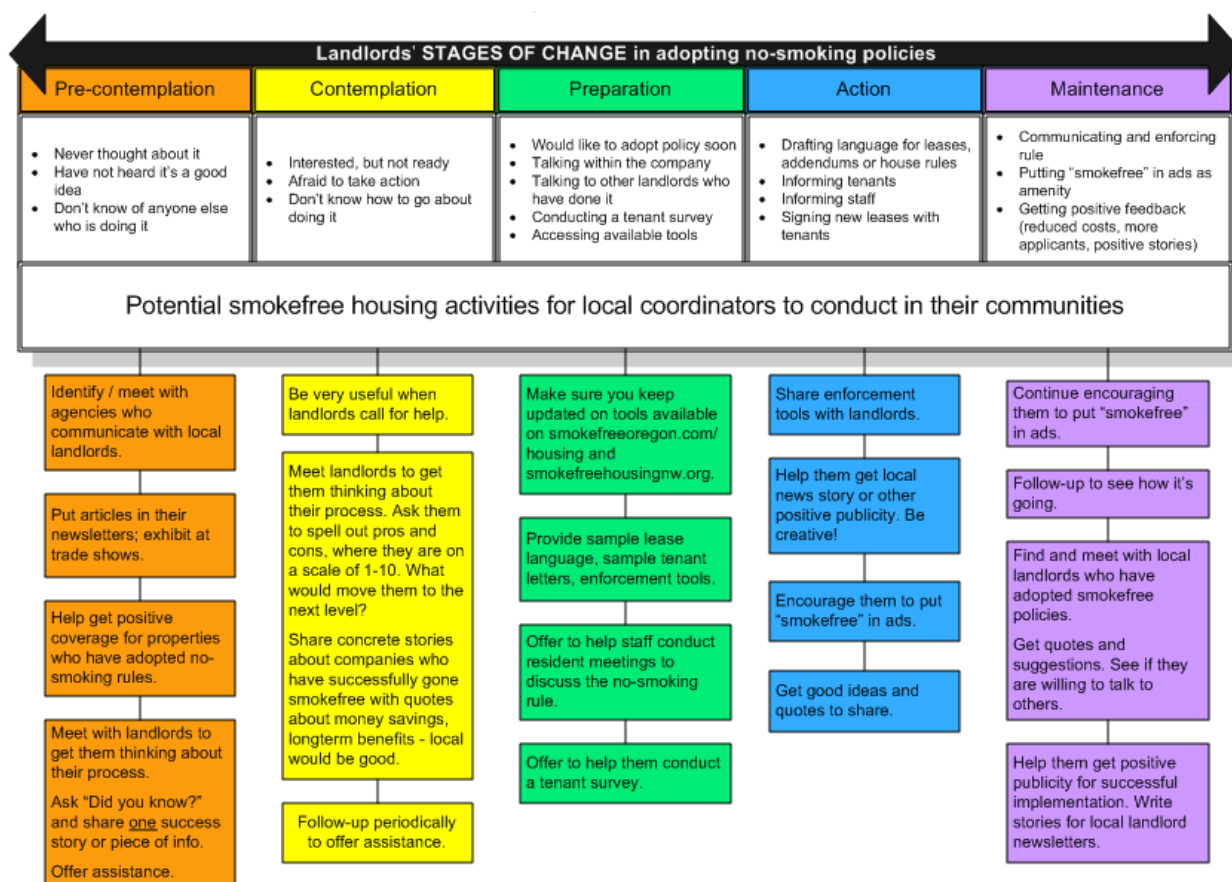
-
- ⁴³ Bartecchi C. Alsever RN. Nevin-Woods C. Thomas WM. Estacio RO. Bucher Bartelson B. Krantz MJ. Reduction in the Incidence of Acute Myocardial Infarction Associated With a Citywide Smoking Ordinance . *Circulation*. 2006;114:1490-1496.
- ⁴⁴ Centers for Disease Control and Prevention. Reduced hospitalizations for acute myocardial infarction after implementation of a smoke-free ordinance – city of Pueblo, Colorado, 2002-2006. *Morbidity and Mortality Weekly Report*. January 2, 2009. 57(51&52).
- ⁴⁵ Juster HR. Loomis BR. Hinman TM. Farrelly MC. Birkhead GS. Declines in hospital admissions for acute myocardial infarction in New York State after implementation of a comprehensive smoking ban. *American Journal of Public Health*. 2007;97:2035–2039.
- ⁴⁶ Torabi MR. Reduced admissions for acute myocardial infarction associated with a public smoking ban: matched controlled study. *Journal of Drug Education*. 2007; 37(3):217-226.
- ⁴⁷ Sargent RP. Shepard RM. Glantz SA. Reduced incidence of admissions for myocardial infarction associated with public smoking ban: before and after study. *British Medical Journal*. 2004; 328:977-980.
- ⁴⁸ Lemstra M. Neudorf C. Opondo J. Implications of a public smoking ban. *Canadian Journal of Public Health*, January/February 2008; 99(1).
- ⁴⁹ Pell JP. Haw S. Cobbe S. Newby DE. Pell ACH. Fischbacher C. McConnachie A. Pringle S. Murdoch D. Dunn F. Oldroyd K. MacIntyre P. O'Rourke B. Borland W. Smoke-free legislation and hospitalizations for acute coronary syndrome. *New England Journal of Medicine*. .2008; 359:482.
- ⁵⁰ Gotz NK. Van Tongeren M. Wareing H. Wallace LM. Semple S. MacCalman L. Changes in air quality and second-hand smoke exposure in hospitality sector businesses after introduction of the English smoke-free legislation. *Journal of Public Health*. December 2008.
- ⁵¹ Semple S. Creely KS. Naji A. Miller BG. Ayres JG. Secondhand smoke levels in Scottish pubs: the effect of smoke-free legislation. *Tobacco Control* 2007;16:127-132.
- ⁵² Repace JL. Hyde JN. Brugge D. Air pollution in Boston bars before and after a smoking ban. *BMC Public Health*. 2006.
- ⁵³ Cesaroni, G., Forastiere, F., Agabiti, N., Valente, P., Zuccaro, P., Perucci, C.A., 2008. Effect of the Italian smoking ban on population rates of acute coronary events. *Circulation*. 117 (9), 1183–1188.
- ⁵⁴ Edwards R. Thomson G. Wilson N. Waa A. Bullen C. O’Dea D. Gifford H. Glover M. Laugesen M. Woodward A. After the smoke has cleared: evaluation of the impact of a new national smoke-free law in New Zealand. *Tobacco Control*. 2008 Feb;17(1):e2.
- ⁵⁵ Lotrean LM. Effects of comprehensive smoke-free legislation in Europe. *Salud publica Mex*. 2008. 50(3): 292-298.
- ⁵⁶ Llewellyn DJ. Lang IA. Langa KM. Naughton F. Matthews FE. Exposure to secondhand smoke and cognitive impairment in non-smokers: national cross sectional study with cotinine measurement. *British Medical Journal*. 2009; 338:b462.
- ⁵⁷ Lightwood JM. Coxson PG. Bibbins-Domingo K. Williams LW. Goldman L. Coronary heart disease attributable to passive smoking: CHD policy model. *American Journal of Preventive Medicine*. January 2009. 36(1):13-20.
- ⁵⁸ Centers for Disease Control and Prevention. Reduced hospitalizations for acute myocardial infarction after implementation of a smoke-free ordinance – city of Pueblo, Colorado, 2002-2006. *Morbidity and Mortality Weekly Report*. January 2, 2009. 57(51&52).

-
- ⁵⁹King BA, Peck RM, Babb SD. Cost-savings associated with prohibited smoking in U.S. subsidized housing. *American Journal of Preventive Medicine*. April 2013.
- ⁶⁰ Ong, M. K., Diamant, A. L., Zhou, Q., Park, H. Y., & Kaplan, R. M. Estimates of smoking-related property costs in California multiunit housing. *Journal Information*, 2012. 102(3).
- ⁶¹ King, BA., Cummings, KM, Mahoney, MC, Juster, HR, & Hyland, AJ. Multiunit housing residents' experiences and attitudes toward smoke-free policies. *Nicotine & Tobacco Research*, 2010. 12(6), 598-605.
- ⁶² Licht, A. S., King, B. A., Travers, M. J., Rivard, C., & Hyland, A. J. Attitudes, experiences, and acceptance of smoke-free policies among US multiunit housing residents. *American Journal of Public Health*, 2012. 102(10), 1868-1871.
- ⁶³ Baezconde-Garbanati, L. A., Weich-Reushé, K., Espinoza, L., et al. (2011). Secondhand smoke exposure among Hispanics/Latinos living in multiunit housing: exploring barriers to new policies. *American Journal of Health Promotion*, 25(sp5), S82-S90.
- ⁶⁴ Osypuk, T. L., & Acevedo-Garcia, D. (2010). Support for smoke-free policies: A nationwide analysis of immigrants, US-born, and other demographic groups, 1995–2002. *Journal Information*, 100(1).
- ⁶⁵ Levy, D. E., Rigotti, N. A., & Winickoff, J. P. Tobacco Smoke Exposure in a Sample of Boston Public Housing Residents. *American journal of preventive medicine*, 2013. 44(1), 63-66.
- ⁶⁶ King, B. A., Mahoney, M. C., Cummings, K. M., & Hyland, A. J. (2011). Intervention to promote smoke-free policies among multiunit housing operators. *Journal of public health management and practice: JPHMP*, 17(3), E1.
- ⁶⁷ Jackson, S. L., & Bonnie, R. J. A systematic examination of smoke-free policies in multiunit dwellings in Virginia as reported by property managers: implications for prevention. *American Journal of Health Promotion*, 2011. 26(1), 37-44.
- ⁶⁸ Modayil, M. V., Consolacion, T. B., Isler, J., Soria, S., & Stevens, C. Cost-Effective Smoke-Free Multiunit Housing Media Campaigns Connecting With Local Communities. *Health Promotion Practice*, 2011. 12(6 suppl 2), 173S-185S.
- ⁶⁹ Winickoff, J., Gottlieb, M., & Mello, M. M. Indoor Smoking Regulations in Public Housing. *NEJM*, 2010. 362(24), 2319.
- ⁷⁰ Kline RL. Smoke knows no boundaries: legal strategies for environmental tobacco smoke incursions into the home within multi-unit residential dwellings. *Tob Control*. 2000;9:201–205.
- ⁷¹ Schoenmarklin, S. Secondhand Smoke Seepage into Multi-Unit Affordable Housing. *Tobacco Control Legal Consortium*. 2010.
- ⁷² Schoenmarklin, S. [Accessed August 22, 2009] Analysis of the Authority of Housing Authorities and Section 8 Multiunit Housing Owners to Adopt Smoke-Free Policies in Their Residential Units. Smoke-Free Environments Law Project. http://www.tcsg.org/sfelp/public_housing24E577.pdf.
- ⁷³ Smoke-Free Environments Law Project, Housing Authorities/Commissions which have adopted smoke-free policies, available at <http://www.tcsg.org/sfelp/SFHousingAuthorities.pdf>.
- ⁷⁴ Ortland W. Secondhand smoke, condominiums and the legal context. St. Paul MN: Public Health Law Center, William Mitchell College of Law, 2011.
- ⁷⁵ Pizacani, B., Laughter, D., Menagh, K., Stark, M., Drach, L., & Hermann-Franzen, C. Moving multiunit housing providers toward adoption of smoke-free policies. 2011. *Preventing Chronic Disease*, 8(1).
- ⁷⁶ Cheng, K. W., Glantz, S. A., & Lightwood, J. M. (2011). Association between smokefree laws and voluntary smokefree-home rules. *American journal of preventive medicine*, 41(6), 566-572.

⁷⁷ Winickoff, J., Gottlieb, M., & Mello, M. M. (2010). Indoor Smoking Regulations in Public Housing. *NEJM*, 362(24), 2319.

⁷⁸ Secondhand smoke in apartment buildings: a summary of Minnesota research. Center for Energy and Environment. http://www.mnsmokefreehousing.org/documents/Research_summary.pdf. Accessed October 8, 2010.

Appendix A:



Note: Adapted with permission from material developed by Health in Sight LLC.

From: Pizacani, B., Laughter, D., Menagh, K., Stark, M., Drach, L., & Hermann-Franzen, C. Moving Multiunit Housing Providers Toward Adoption of Smoke-Free Policies. 2011. *Preventing chronic disease*, 8(1).

Appendix B:

Table 1

Table Assessing Costs and Benefits of Possible HUD Approaches to Smoking in Public Housing

Courses of Action	Costs	Benefits	Comment
HUD takes no regulatory action: PHAs regulate smoking policies on their own.	Long-term continued tobacco smoke exposure in most public housing settings for the foreseeable future.	Encourages more local control and fewer households with smokers would be at-risk for displacement.	The <i>status quo</i> will likely continue to result in more households below or near the poverty level suffering effects of tobacco smoke exposure than higher SES households due to lack of market forces in public housing.
HUD interprets existing air quality requirements to include tobacco smoke.	Without a clear directive to make programs non-smoking, many PHAs would likely maintain <i>status quo</i> resulting in continued exposure and resulting harm to residents. PHAs that take action may be forced to evict non-complying tenants.	Some PHAs may act on regulatory interpretation by prohibiting smoking and would be forced to respond to residents' complaints concerning air quality problems caused by tobacco smoke.	This intermediate step falls short of directing PHA policy but could lead to an increase in smoke-free public housing without the need for changes in HUD's granting requirements.
By conditioning full funding, HUD effectively requires all federallyfunded public housing to phase-in 100% smoke-free policies.	HUD action would be controversial. Enforcement could require PHAs and Section 8 private landlords to evict noncomplying tenants.	Would likely result in dramatic reduction of tobacco smoke exposure and resulting harm for a vulnerable population.	By conditioning full funding on policy compliance by PHAs, HUD is in a unique position to eliminate a major preventable cause of disease from the home where market forces have retarded adoption of such policies.

From: Winickoff, J., Gottlieb, M., & Mello, M. M. Indoor Smoking Regulations in Public Housing. *NEJM*, 2010. 362(24), 2319.