

Implementing Smoke-Free Housing Policies Among Multiunit Housing Owners in New York City Between 2012 and 2015

Tobacco Use Insights
Volume 12: 1–10
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1179173X19859355



Indira Debchoudhury and Shannon M Farley

Bureau of Chronic Disease Prevention and Tobacco Control, New York City Department of Health and Mental Hygiene, Queens, NY, USA.

ABSTRACT: Smoke-free regulations are the norm in workplaces and public outdoor areas across New York City (NYC), and smoke-free apartment building regulations are less widespread. In 2017, more than one-third (37.6%) of NYC multiunit housing (MUH) residents reported breathing secondhand smoke (SHS) from neighboring units. In 2015, the NYC Health Department conducted a cross-sectional phone survey among a random sample of NYC low-income and market-rate MUH property owners/managers as a follow-up to a 2012 study. The study compared owners' experiences and attitudes regarding smoke-free policies. Bivariate and multivariable logistic regression analyses were used. Overall, the proportion of owners who have a policy prohibiting smoking in individual units (33% vs 37%) increased between 2012 and 2015. In both waves, owners without low-income units (wave 1: 36%, wave 2: 40%) were more likely to have smoke-free housing policies than those with low-income units (wave 1: 26%, wave 2: 30%). The models adjusted for factors such as current smoking, size and nature of housing units, and several beliefs. Owners in 2015 were more likely to have a smoke-free policy (adjusted odds ratio [AOR]: 1.25, 95% confidence interval [CI]: 1.003, 1.564) and, among those without a current smoke-free policy, to have future interest in smoke-free unit policies (AOR: 1.68, 95% CI: 1.17, 2.39) than in 2012. An increasing proportion of NYC MUH owners are reducing tenant exposure to SHS and providing them with a healthier environment. We expect to see further expansion of smoke-free housing in NYC as positive norms grow.

KEYWORDS: Smoke-free Housing; Multiunit Housing; New York City

RECEIVED: April 16, 2019. **ACCEPTED:** May 23, 2019.

TYPE: Original Research

FUNDING: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This publication was supported by the Grant or Cooperative Agreement (No. NU58DP005956), funded by the Centers for Disease Control and Prevention. This article's contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Indira Debchoudhury, Bureau of Chronic Disease Prevention and Tobacco Control, New York City Department of Health and Mental Hygiene, 2 Gotham Center, 42-09 28th Street, 11th Floor, Queens, NY 11101, USA. Email: idebchou@health.nyc.gov

Introduction

There is no safe level of exposure to secondhand smoke (SHS).¹ SHS causes health problems such as asthma, heart disease, and cancer.² Exposure to SHS causes an estimated 41 000 deaths each year among adults in the United States.¹ Experts say that the only way to completely protect people from SHS is to prohibit smoking indoors.³

For more than a decade, smoke-free air laws, such as the New York City (NYC) Smoke-Free Air Act (SFAA), have been implemented within workplaces, restaurants, bars, public parks, beaches, and other public spaces.³ Introducing smoke-free air laws in these environments has decreased SHS exposure among adults and children in public settings,^{4,5} yet exposure in private settings, such as homes, has been addressed by few jurisdictions outside of California and is still a public health concern.⁶ In 2017, NYC required all residential buildings with 3 or more units, including rental buildings, cooperatives, and condominiums, to adopt a written smoking policy and inform all current and prospective tenants of the building policy around smoking with this new law.⁷ In the United States, residential smoke-free air policies are mostly voluntary, and they cover a fraction of multiunit housing (MUH) even though MUH collectively accounts for a major locus of SHS exposure.^{8,9} In 2018, the US Department of Housing and Urban Development (HUD) prohibited smoking in all public housing residences, but, except for a relatively small number of

municipalities, mostly in California, no laws or regulations offer broad protection from SHS in MUH.^{10,11}

Everyone should have the option to live in a smoke-free home. Unfortunately, for those who live in MUH, breathing SHS from neighboring units is a common occurrence.^{12,13} SHS often travels through walls, ductwork, windows, and ventilation systems of multiunit buildings and can affect residents in other units, even far from the source of the smoking.^{4,12,14,15} The only fail-proof solution to this problem is for buildings to become entirely smoke free, either by building management voluntarily adopting a policy or by passage and implementation of local laws.

Smoke-free policies are being implemented by MUH owners and managers in communities all across the country in part because residents are speaking up about being exposed to SHS in their apartments.^{16,17} Owners of MUH are also recognizing that a smoke-free building can be a good business decision because operating a smoke-free building can reduce maintenance costs, lower the time and renovation costs associated with turning over a unit, and decrease the risk of a fire, which in turn may reduce insurance rates.^{4,17–19}

In total, 70% of NYC housing is classified as MUH compared with 26% nationwide,^{4,20} making NYC an informative environment in which to assess MUH owners' experiences and attitudes regarding smoke-free policies.⁴ This 2015 update to a 2012 study examined correlates of smoke-free housing (SFH)



policies and interest in implementing smoke-free policies among a large urban sample of MUH owners.⁴ We surveyed owners of market-rate, rent-regulated, and certified low-income MUH in NYC, to (1) compare experiences, attitudes, knowledge, and opinions regarding smoke-free unit policies between 2012 and 2015, (2) assess differences in the proportion of smoke-free unit policies overall and between owners with and without units restricted to certified low-income occupants over time, and (3) determine whether there was a difference in future interest in smoke-free unit policies between years among owners without an existing smoke-free policy.

The data collected from this study can be used to inform outreach programs and educational efforts aimed at expanding and encouraging smoke-free buildings throughout NYC.

Methods

In 2015, the NYC Department of Health and Mental Hygiene (DOHMH) conducted a cross-sectional phone-based survey among a random sample of owners of multiunit market-rate and rent-regulated NYC residential housing as an update to the first study conducted in 2012.⁴ In both waves, a list of approximately 165 000 NYC owners of properties with 3 or more residential units was obtained from the NYC Housing Preservation and Development's (HPD) database of registered owners. A random sample of 6500 owners in 2012 and 10 000 owners in 2015 with 3 or more residential units, proportionally stratified by borough, was selected and contacted, via mail or phone for wave 1 in 2012 and by phone for wave 2 in 2015. Once verbal consent was obtained, the survey was administered in English or Spanish. Participants received US\$30 in compensation for completing the survey.

In wave 1, a total of 1007 owners completed the survey including 383 mail and 624 phone respondents, for a 22% response rate and a 43% cooperation rate.⁴ In wave 2, a total of 1002 owners completed the survey by phone, for an 11% response rate and a 40% cooperation rate. Rates were calculated using the American Association for Public Opinion Research's third definition.⁴ The NYC DOHMH Institutional Review Board approved the study.

Measures

The analyses compare responses from wave 1 and wave 2 MUH owners. Survey questions were based on an unpublished national survey developed by Roswell Park Cancer Institute. Smoking policies were assessed through the following questions: "Do you have a policy prohibiting smoking in residential units?"⁴ Those who answered "yes" (defined throughout as "any smoke-free residential unit policy") were categorized as having either a "100% smoke-free residential unit policy" or "partial smoke-free residential unit policy" based on the answer to the question, "Is smoking prohibited in all of the units within any of your buildings?"⁴ Building characteristics were evaluated

through the following questions: "Do you have a policy prohibiting smoking in individual units?"; "Do you currently enforce the policy prohibiting smoking in individual units?"; "How many buildings do you manage/own?" and "What is the total number of units in all of these buildings combined?" Owners were also asked if any of the units were designated for tenants with certified low income.

Experiences with tenants and SHS exposure were measured using the following questions: "Have you ever received complaints from tenants about cigarette smoke entering their living space?"; "Have tenant complaints about SHS exposure ever led to the threat of suit against you/your company?"; and "In the market segments you rent, do you think there is an interest among renters in smoke-free rental housing?"

Knowledge and opinions of the owners were assessed using the following questions: "Do you consider SHS moving into an apartment from elsewhere on the premises a health issue for tenants?" and "Do you believe that MUH owners can legally adopt policies that prohibit smoking on their properties, including all individual residential units?"

Smoking history was evaluated among all owners through 2 questions from the DOHMH NYC Community Health Survey: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days or not at all?"

Owners with smoke-free units were asked the following questions: "What was the single most important benefit of prohibiting smoking in any building/unit?"; "Do you have a policy in place that prohibits smoking in individual units included in the tenants' leases?"; "Do you enforce the policy prohibiting smoking in individual units?"; "Has a smoke-free policy led to complaints from tenants?"; "Has there been a tenant turnover in response to offering smoke-free buildings/units?"; "Do you publicly advertise smoke-free units?"; and "Has it been easy or difficult in renting units in which smoking is prohibited?"

Owners without smoke-free units were asked the questions: "What are your concerns about prohibiting smoking in building/units?" and "Are you somewhat or very likely to designate smoke-free units in the future if . . . ?" with the following prompted response options: "studies showed improved health; studies showed high demand; owners were implementing smoke-free policies; tenants requested it; insurance cost reduced and/or a turnover cost reduced."

Statistical analysis

Analyses were conducted using SAS version 9.4. Frequencies, proportions, and 95% confidence intervals (CIs) were calculated for all variables of interest. Bivariate analyses tested differences between wave 1 and wave 2 using a Pearson chi-square test. Multivariable logistic models were performed for 2 outcomes: (1) having a policy prohibiting smoking in residential

units and (2) interest in prohibiting smoking in all buildings/units. Adjusted odds ratios (AORs) and 95% CIs were reported. Models were adjusted for current smoking status, total quantity of units owned, any certified low-income units owned, and knowledge related to health hazards of SHS moving into apartments and belief in the legality of MUH owners implementing residential smoke-free policies. All differences emphasized in the text are statistically significant ($P < .05$) unless otherwise indicated.

Results

Overall, there was an increase between wave 1 and wave 2 in the proportion of owners who had a policy prohibiting smoking in individual units (33% vs 37%; Table 1). The proportions of owners without certified low-income units with any SFH policies increased between waves 1 and 2 (36% vs 40%) and remained unchanged among owners with any certified low-income units during the same time period. In both waves, owners without certified low-income units were more likely to have SFH than those with any certified low-income units.

Owners in wave 2 received more complaints from tenants about cigarette smoke entering their home compared with wave 1 (30% vs 26%); however, most of the complaints did not result in a lawsuit against the owners. A greater proportion of owners with any certified low-income units reported that tenants were complaining about cigarette smoke entering their home in wave 2 (38%) compared with wave 1 (30%). In both waves, owners with any certified low-income units were more likely to have received tenant complaints than those without certified low-income units. Owners with certified low-income units reported increased interest from tenants between wave 1 and wave 2 about renting SFH units (65% vs 76%).

Table 2 shows results from bivariate analyses examining any smoke-free residential unit policies among all owners, those without a current smoke-free policy, and interest in adopting residential smoke-free policy among NYC owners of MUH without a current smoke-free policy. Results showed that owners who managed 3 to 10 units were significantly more likely to have smoke-free residential policies than those who managed more units. There was a significant increase in interest in smoke-free residential unit policy between wave 1 (73%) and wave 2 (80%) among owners of more than 10 units. Data showed that owners of 3 to 10 units and certified low-income units were significantly more likely to be interested in smoke-free residential units (72% vs 80%).

Table 3 presents the AORs for established smoke-free residential unit policy and future interest in smoke-free residential unit policy. In the adjusted model for established smoke-free residential unit policy, owners in 2015 were more likely to have an established smoke-free policy (AOR: 1.25, 95% CI: 1.00-1.56) than owners in 2012. In the adjusted future interest in smoke-free residential unit policy model (among owners without a current smoke-free policy), owners in 2015 were more

likely to be interested in a smoke-free residential unit policy than owners in 2012 (AOR: 1.68, 95% CI: 1.17-2.39).

Table 4 demonstrates experiences and attitudes about implementing smoke-free residential units stratified by owners with current smoke-free residential unit policy and those without. The proportion of smoke-free unit owners who believed that the most important benefit of prohibiting smoking in the building/units was making your living environment healthier declined between 2012 and 2015 (58% vs 49%). On the other hand, the proportion of those reporting a benefit to prohibiting smoking in the building/unit with fewer tenant complaints increased between 2012 and 2015 (9% vs 17%). There was an increase from wave 1 (68%) to wave 2 (78%) among owners who included a policy in tenants' leases prohibiting them from smoking in individual units. In wave 2, among those with a policy, more than two-thirds (68%) of owners enforced this policy with a clause in the lease. There were more owners in wave 2 (91% vs 95%) who found it easier to rent units in which smoking was prohibited.

Owners who lacked smoke-free residential unit policies in wave 2 reported the most common concern about prohibiting smoking in buildings/units with complaints and resistance from tenants (42%). Most of the owners who did not have a smoke-free residential unit policy in waves 1 and 2 said that they were somewhat or very likely to designate smoke-free units in the future if studies showed improved health (81% and 83%), studies showed high demand (65% and 66%), or tenants requested it (61% and 60%).

Discussion

Multiple studies have assessed the existence of and experience with smoke-free policies in MUH throughout the United States among owners and tenants.^{4,6,9} This study is the first we are aware of that examines changes in the prevalence of having a smoke-free policy among owners of MUH, comparing experiences, attitudes, knowledge, and opinions regarding smoke-free unit policies over time. We found a significant increase in the prevalence of MUH owners with smoke-free unit policies between 2012 and 2015. We attribute this change to concerted efforts at the local and federal levels to support expansion of SFH. In NYC, DOHMH and other local tobacco control advocates, partially funded by federal grants (Community Transformation Grant and Partnership to Improve Community Health), have educated multiunit building stakeholders about the benefits of smoke-free buildings and encouraged residential buildings to adopt smoke-free policies voluntarily. In addition, DOHMH partnered with HPD to require applicants for financing participation in a healthy housing training that focuses on the integration of healthy building practices during building design, construction, and renovation and during ongoing building operations and maintenance.²¹ The primary topics that are covered at the training are SFH, integrated pest management, and active living.^{21,22} These shifting social norms

Table 1. Characteristics, experiences, knowledge, and opinions among NYC owners and managers of multiunit housing in 2012 and 2015 by income level.

	WAVE 1			WAVE 2			WAVE 1 VS WAVE 2, OVERALL	ANY CERTIFIED LOW-INCOME UNIT, WAVE 1 VS WAVE 2	NO CERTIFIED LOW-INCOME UNIT, WAVE 1 VS WAVE 2		
	OVERALL (N = 1007), % (95% CI)	ANY CERTIFIED LOW-INCOME UNITS (N = 280), %	NO CERTIFIED LOW-INCOME UNITS (N = 664), %	P VALUE	OVERALL (N = 1002), % (95% CI)	ANY CERTIFIED LOW-INCOME UNITS (N = 307), %				NO CERTIFIED LOW-INCOME UNITS (N = 622), %	P VALUE
<i>Building characteristics</i>											
Owners with any smoke-free residential unit policy	33 (30, 36)	26	36	<.01	37 (34, 40)	30	40	<.01	.04	.27	.05
Owners with 100% smoke-free residential unit policy	83 (78, 87)	81	83	.64	85 (81, 88)	84	85	.68	.32	.47	.25
<i>Number of buildings owned/managed</i>											
1	58 (55, 61)	50	62	<.01	51 (48, 55)	44	56	<.01	<.01	.10	.02
2	15 (13, 17)	15	15		14 (12, 16)	12	15		.47	.55	.66
3 or more	27 (24, 29)	35	23		34 (31, 37)	44	29		<.01	.03	<.01
<i>Total number of units owned/managed</i>											
3-10	65 (62, 68)	53	72	<.01	56 (53, 60)	46	63	<.01	<.01	.06	<.01
>10	35 (32, 38)	47	28		44 (40, 47)	54	36		<.01	.06	<.01
<i>Experiences with tenants</i>											
Ever received tenant complaints about cigarette smoke entering living space	26 (23, 28)	30	24	.09	30 (27, 33)	38	25	<.01	.04	.03	.58
Tenant complaints about SHS exposure ever led to threat of law suit against owner/company	7 (4, 11)	12	6	.07	5 (3, 8)	4	5	.76	.27	.20	.80

Table 1. (Continued)

	WAVE 1		WAVE 2		P VALUE	WAVE 1 VS WAVE 2, OVERALL	P VALUE	ANY CERTIFIED LOW-INCOME UNIT, WAVE 1 VS WAVE 2	P VALUE	NO CERTIFIED LOW-INCOME UNIT, WAVE 1 VS WAVE 2	P VALUE
	OVERALL (N=1007), % (95% CI)	ANY CERTIFIED LOW-INCOME UNITS (N=280), %	NO CERTIFIED LOW-INCOME UNITS (N=664), %	P VALUE							
Interest among renters in smoke-free housing	74 (71, 77)	65	79	<.01	77 (74, 80)	76	78	.71	.16	.01	.50
<i>Knowledge and opinions</i>											
SHS moving into apartment from elsewhere on the premises is health issue for tenants	77 (74, 79)	74	78	.14	78 (76, 81)	79	77	.60	.39	.32	.78
Believe multiunit housing owners can legally adopt policies that prohibit smoking, including in all residential units	67 (64, 70)	60	70	<.01	71 (68, 74)	67	73	.06	.08	.09	.21
<i>Respondent characteristics</i>											
Current smoker	9 (7, 11)	11	8	.27	7 (6, 9)	7	8	.17	.19	.12	.63
Former smoker	26 (23, 28)	23	27		24 (21, 27)	21	26		.42	.51	.65

Abbreviations: CI, confidence interval; NYC, New York City; SHS, secondhand smoke. Missing values were not included in the table. P values were generated by Pearson chi-square. Statistically Significant values (P<.05) are highlighted in bold.

Table 2. Correlates of having any smoke-free residential unit policy and interest in adopting residential smoke-free unit policy among NYC owners and managers of multiunit housing without a current smoke-free policy in 2012 and 2015.

	WAVE 1	WAVE 2	WAVE 1 VS WAVE 2	WAVE 1	WAVE 2	WAVE 1 VS WAVE 2	WAVE 1	WAVE 2	WAVE 1 VS WAVE 2	WAVE 1	WAVE 2	WAVE 1 VS WAVE 2
	OWNERS WITH SMOKE-FREE RESIDENTIAL UNIT POLICY (N=316)	OWNERS WITH SMOKE-FREE RESIDENTIAL UNIT POLICY (N=366)	OWNERS WITH SMOKE-FREE RESIDENTIAL UNIT POLICY	OWNERS WITHOUT A CURRENT SMOKE-FREE POLICY (N=653)	OWNERS WITHOUT A CURRENT SMOKE-FREE POLICY (N=621)	OWNERS WITHOUT A CURRENT SMOKE-FREE POLICY	INTEREST IN SMOKE-FREE RESIDENTIAL UNIT POLICY (N=375)	INTEREST IN SMOKE-FREE RESIDENTIAL UNIT POLICY (N=385)	INTEREST IN SMOKE-FREE RESIDENTIAL UNITS	% (95% CI)	% (95% CI)	P VALUE
	P VALUE	P VALUE	P VALUE	% (95% CI)	% (95% CI)	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE	P VALUE
Very/somewhat interested in prohibiting smoking in all buildings or units			NA	73 (69, 76)	80 (76, 84)	.01						NA
<i>Respondent smoking status</i>												
Former/never smoker	34 (31, 37)	<.01	.19	89 (87, 92)	.01	<.01	76 (72, 80)	<.01	80 (77, 84)	.29	.69	
Current smoker	16 (9, 24)			11 (8, 13)			42 (28, 55)		73 (57, 88)			
<i>Total quantity of units owned/managed</i>												
3-10	41 (37, 45)	<.01	<.01	57 (53, 61)	<.01	<.01	73 (68, 78)	.80	80 (75, 85)	.87	.04	
>10	17 (13, 22)			43 (39, 47)			72 (66, 78)		80 (74, 85)			
<i>Certified low-income units owned/managed</i>												
None	36 (32, 40)	<.01	.11	67 (63, 71)	.01	<.01	72 (67, 77)	.96	79 (74, 84)	.55	.05	
Any	26 (21, 32)			33 (29, 37)			72 (65, 79)		81 (75, 87)			
<i>SHS moving into apartment is health issue for tenants</i>												
No	24 (18, 29)	<.01	.39	26 (23, 30)	<.01	.01	47 (37, 56)	<.01	66 (55, 76)	<.01	.50	
Yes	35 (31, 38)			74 (70, 77)			80 (76, 84)		83 (79, 87)			
<i>Believe multiunit housing owners can legally adopt policies that prohibit smoking including in all residential units</i>												
No	10 (7, 14)	<.01	.08	45 (41, 49)	<.01	<.01	57 (50, 64)	<.01	72 (65, 79)	<.01	.68	
Yes	44 (40, 48)			55 (51, 59)			80 (76, 85)		87 (83, 91)			

Abbreviations: CI, confidence interval; NA, Not Applicable; NYC, New York City; SHS, secondhand smoke.

Missing values were not included in the table.

P values were generated by Pearson chi-square.

Statistically significant values ($P < .05$) are highlighted in bold.

Table 3. Multivariable logistic regression models of established smoke-free residential unit policy and future interest in smoke-free residential unit policy.

	MODEL 1—ESTABLISHED SMOKE-FREE RESIDENTIAL UNIT POLICY, AOR (95% CI)	MODEL 2—FUTURE INTEREST IN SMOKE-FREE RESIDENTIAL UNIT POLICY, AOR (95% CI)
<i>Year</i>		
2012	REF	REF
2015	1.25 (1.00, 1.56)	1.68 (1.17, 2.39)
<i>Respondent smoking status</i>		
Former/never smoker	REF	REF
Current smoker	0.44 (0.28, 0.71)	0.36 (0.21, 0.59)
<i>Total quantity of units owned/managed</i>		
3-10	REF	REF
>10	0.59 (0.46, 0.75)	1.04 (0.72, 1.49)
<i>Certified low-income units owned/managed</i>		
None	REF	REF
Any	1.22 (0.95, 1.56)	0.91 (0.62, 1.31)
<i>SHS moving into apartment is health issue for tenants</i>		
No	REF	REF
Yes	1.23 (0.92, 1.64)	3.10 (2.12, 4.53)
<i>Believe multiunit housing owners can legally adopt policies that prohibit smoking including in all residential units</i>		
No	REF	REF
Yes	6.23 (4.56, 8.53)	2.57 (1.82, 3.65)

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; SHS, secondhand smoke. Statistically significant values ($P < .05$) are highlighted in bold.

around SFH locally and across the nation have likely contributed to the changes we see taking place.

Owners with no certified low-income units were the drivers of the increase in smoke-free unit policies between 2012 and 2015, and were more likely to have smoke-free unit policies than those with certified low-income units. This is probably due to the fact that state law and regulations legally prevent owners from adopting smoke-free policies in rent-controlled or rent-stabilized rental units, which comprise roughly half of the residential rental market.^{23,24} This hurdle was overcome for public housing, as HUD prohibited smoking in residential units as of July 30, 2018. The Centers for Disease Control and Prevention has estimated that smoke-free public housing in New York State (NYS) will save more than US\$57 million annually in health care, renovations, and fewer fires.²⁵ If SFH was implemented in all subsidized housing in NYS, the savings could be more than US\$120 million annually.²⁵

Owners who have an established smoke-free residential unit policy were less likely to be current smokers, less likely to own/manage more than 10 units, and more likely to believe MUH owners can legally adopt policies that prohibit smoking including in all residential units. There is increasing awareness

among owners that their tenants want their home to be smoke free. A 2012 poll of NYC voters found that nearly 60% wanted to live in a place that prohibited smoking.²⁶ In a recent research in Massachusetts and Minnesota states, nearly 80% of owner-occupants reported that they would either “definitely” (63%) or “probably” (17%) choose a smoke-free building over a similar building that allowed smoking.²⁶ Not only do smoke-free policies benefit tenant health, they likely attract tenants, minimize maintenance costs, reduce fire risks, and decrease the potential for legal liability due to non-smoking tenants’ exposure to SHS.^{20,27,28} In both waves, owners reported that the single most important benefit of prohibiting smoking in their buildings was the health of their tenants and the community.²⁹

Among owners without smoke-free residential unit policy, there was increased interest in establishing smoke-free residential units between 2012 and 2015. These owners are less likely to be current smokers than former/never smokers, are more likely to believe that moving into an apartment with SHS is a health issue, and more likely to believe that MUH owners can legally adopt policies that prohibit smoking including in all residential units. Previous studies show that although renters desire smoke-free policies, owners reported little interest in

Table 4. Comparing any smoke-free residential unit policy experiences with and attitudes about smoke-free residential units among owners and managers of multiunit housing in NYC (2012 vs 2015).

OWNERS WITH CURRENT SMOKE-FREE RESIDENTIAL UNIT POLICY	N=316		N=366		P VALUE
	PERCENTAGE	95% CI	PERCENTAGE	95% CI	
<i>Single most important benefit of prohibiting smoking in any building/unit</i>					
Healthier for tenants/community	58	(52, 63)	49	(44, 54)	.04
Fewer complaints from tenants	9	(6, 12)	17	(13, 21)	.03
Lowered maintenance costs	8	(5, 11)	10	(7, 13)	.01
Other	20	(16, 25)	18	(14, 23)	.35
No benefit	5	(2, 7)	2	(1, 3)	.05
Policy prohibiting smoking in individual units is included in tenants' leases	68	(63, 74)	78	(74, 82)	.01
Enforce policy prohibiting smoking in individual units	82	(77, 86)	85	(81, 88)	.32
Enforce with clause in lease	58	(52, 65)	68	(62, 73)	.02
Enforce and penalize with fines	5	(2, 7)	6	(4, 9)	.03
Other	37	(31, 43)	26	(21, 31)	.82
Smoke-free policy led to complaints from tenants	7	(4, 10)	6	(3, 8)	.41
<i>Tenant turnover in response to offering smoke-free buildings/units</i>					
Increased	4	(1, 6)	6	(3, 8)	.21
Decreased	7	(4, 10)	7	(4, 10)	.93
Stayed the same	89	(86, 93)	87	(84, 91)	.47
Publicly advertise smoke-free units	20	(15, 24)	22	(18, 27)	.42
<i>Ease or difficulty in renting units in which smoking is prohibited</i>					
Very/somewhat easy	91	(88, 94)	95	(93, 98)	.03
Somewhat/very difficult	9	(6, 12)	5	(2, 7)	.51
OWNERS WITHOUT SMOKE-FREE RESIDENTIAL UNIT POLICY	N=653		N=621		
<i>Common concerns about prohibiting smoking in buildings/units</i>					
Tenant resistance or complaints	38	(34, 41)	42	(38, 46)	.12
Legal risks	29	(25, 32)	31	(28, 35)	.32
Resources for enforcement	21	(18, 24)	26	(23, 30)	.03
<i>Somewhat/very likely to designate smoke-free units in the future if</i>					
Studies showed improved health	81	(78, 84)	83	(80, 86)	.51
Studies showed high demand	65	(62, 69)	66	(62, 70)	.86
Other owners were implementing smoke-free policies	61	(57, 65)	59	(55, 63)	.41
Tenants requested it	61	(57, 65)	60	(56, 64)	.73
Insurance costs reduced	59	(55, 63)	49	(45, 53)	<.01
Turnover costs reduced	53	(49, 57)	55	(47, 55)	.51

Abbreviations: CI, confidence interval; NYC, New York City.
Missing values were not included in the table.
P values were generated by Pearson chi-square.
Statistically significant values ($P<.05$) are highlighted in bold.

reducing the environmental transfers of smoke or implementing smoke-free policies due to vacancy concerns, legal issues, and enforcement challenges.^{4,30}

New York City MUH owners without smoke-free policies reported that resources for enforcement were an increasing concern about prohibiting smoking in their buildings over time. Owners without smoke-free policies reported receiving complaints from tenants regarding the unwanted smell of tobacco smoke in their personal living unit, with most indicating that such complaints require significant time to resolve, which takes time away from other building responsibilities.³⁰ If smoke-free policies were in place, building management would, arguably, not have to spend as much time to deal with complaints, giving them more time to resolve other essential issues on the property. Although prevalence decreased over time, owners in our study also stated that if insurance costs were reduced they would more likely designate smoke-free units in their buildings in the future. Having a smoke-free policy may present an opportunity to reduce insurance costs in the future because SFH reduces the risk of fire. Also, implementing a smoke-free policy demonstrates to insurance companies that steps are being taken to minimize the risk of building damage. Although most insurance companies do not yet offer specific benefits for smoke-free policies, there are certain companies that are beginning to offer discounts on insurance premiums to those owners/managers of smoke-free buildings.³¹

In both waves, approximately one-third of owners reported that they had low-income units. Owners with certified low-income units were more likely to report that tenants complained about cigarette smoke entering living spaces in wave 2 compared with wave 1. This is likely due to an increase in awareness due to the changing social norms around smoke-free MUH in NYC. Studies have shown that low-income and communities of color residents experience significantly higher than average rates of SHS exposure.³² Low-income unit tenants face additional challenges in avoiding SHS exposure as they are more likely to have difficulty finding housing alternatives due to a fixed or limited income and might not be able to afford to move to another apartment to escape from the smoke entering their homes.³³ In general, there was very little difference among owners of buildings with certified low-income units across waves, indicating the need for more outreach and effort to support SFH among this population. Keeping all MUH residents safe and healthy in their homes needs to be a priority.

Limitations

This study is not without limitations. First, this study has excluded housing with less than 3 units from our definition of MUH.⁴ There are more 1- and 2-unit residences in NYC than MUH with 3 or more units.⁴ To guarantee adequate representation of the larger MUH buildings, the sample was restricted to MUH with 3 or more units.⁴ Second, many owners/managers did not respond to the survey. Due to the low response rate,

the results from our survey may not be generalizable to NYC owners throughout the city. Finally, these results may not be generalizable to other MUH markets given the unique urban environment of NYC, such as rent regulation. Nevertheless, because most of the owners had just 1 building and 56% managed 10 or fewer units, these data may be useful to inform outreach and education efforts in smaller cities as well.⁴

Conclusions

It is a positive sign that the proportion of MUH owners reporting having smoke-free residential unit policies increased over time in NYC. It is also encouraging that more tenants are notifying owners about cigarette smoke entering their living spaces and seeking to live in a smoke-free home. On August 28, 2017, local law 147 was signed.^{7,34} This new law requires building owners/managers to create a smoking policy that details whether or not the building permits smoking, and discloses it to existing and potential residents.^{7,34} We are hopeful that the disclosure of the building smoking status will help New Yorkers make healthier choices and diminish exposure to SHS. We are optimistic that it will improve the NYC MUH living environment. We anticipate that the implementation of the HUD rule requiring public housing to go smoke free will motivate other subsidized housing, and perhaps the real estate market on a broader level, to have more interest in SFH.

Author Contributions

Indira Debchoudhury and Shannon M Farley designed the study. Indira Debchoudhury performed the analyses. All authors drafted and edited the manuscript.

REFERENCES

- Centers for Disease Control and Prevention: Smoking & Tobacco Use. Health effects of secondhand smoke. https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/health_effects/index.htm. Up-dated 2017. Accessed October 24, 2017.
- American Cancer Society. Health risks of secondhand smoke. <https://www.cancer.org/cancer/causes/tobacco-and-cancer/secondhand-smoke.html>. Up-dated 2017. Accessed November 7, 2017.
- Smoke-Free Environments Law Project. Environmental tobacco smoke in apartments. <http://www.tcs.org/sfelp/apartment.htm>. Up-dated 2011. Accessed November 17, 2017.
- Farley SM, Waddell E, Coady MH, et al. Correlates of smoke-free housing policies among multiunit housing owners in New York City. *J Urban Health*. 2015;92:291–303.
- Chang C, Leighton J, Mostashari F, et al. The New York City Smoke Free Act: second-hand smoke as a worker health and safety issue. *Am J Ind Med*. 2004;46:188–195.
- Gentzke A, Hyland A, Kiviniemi M, et al. Attitudes and experiences with secondhand smoke and smoke-free policies among subsidized and market-rate multiunit housing residents living in sex diverse communities in the USA. *Tob Control*. 2018;27:194–202.
- The New York City Council. Disclosure of smoking policies for class a multiple dwellings. <http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3028946&GUID=E8E7774B-D4D0-43BB-B7E9-919852FABED8&FullText=1>. Up-dated 2017. Accessed December 1, 2017.
- Ashley MJ, Ferrence R. Reducing children's exposure to environmental tobacco smoke in home: issues and strategies. *Tob Control*. 1998;7:61–65.
- Wilson KM, Klein JD, Blumkin AK, Gottlieb M, Winickoff JP. Tobacco smoke exposure in children who live in multiunit housing. *Pediatrics*. 2011;127:85–92.
- Centers for Disease Control and Prevention. Eliminating exposure to second-hand smoke: outcome indicators for comprehensive tobacco control programs.

- https://www.cdc.gov/tobacco/stateandcommunity/tobacco_control_programs/surveillance_evaluation/eliminating-exposure/pdfs/eliminating-exposure-koi-goal2-508.pdf. Up-dated 2017. Accessed January 8, 2018.
11. American Nonsmokers Rights Foundation (ANRF). U.S. laws and policies restricting or prohibiting smoking in private units of multi-unit housing. <http://no-smoke.org/wp-content/uploads/pdf/smokefreemuh.pdf>. Up-dated 2018. Accessed November 9, 2018.
 12. King BA, Travers M, Cummings M, Mahoney MC, Hyland AJ. Secondhand smoke transfer in multiunit housing. *Nicotine Tob Res.* 2010;12:1133–1141.
 13. New York City Department of Health and Mental Hygiene. Community health survey. <https://a816-healthpsi.nyc.gov/epiquery/CHS/CHSXIndex.html>
 14. Kraev T, Adamkiewicz G, Hammonf S, et al. Indoor concentrations of nicotine in low income, multiunit housing associations with smoking behaviors and housing characteristics. *Tob Control.* 2009;18:438–444.
 15. US Department of Health and Human Services. The Surgeon General’s call to action to promote healthy homes: the health consequences of involuntary exposure to tobacco smoke. <https://www.surgeongeneral.gov/library/reports/second-hand-smoke-consumer.pdf>. Up-dated 2017. Accessed April 16, 2017.
 16. Americans for Nonsmokers Right (ANRF). Residents are often exposed in their homes. <https://no-smoke.org/at-risk-people/tenants/>. Up-dated 2018. Accessed August 18, 2018.
 17. King BA, Cummings KM, Mahoney MC, Juster HR, Hyland AJ. Multiunit housing residents’ experiences and attitudes toward smoke-free policies. *Nicotine Tob Res.* 2010;12:598–605.
 18. Oberg M, Jaakkola MS, Pruss-Ustun A, et al. Second-hand smoke: assessing the environmental burden of disease at national and local levels. www.who.int/quantifying_ehimpacts/publications/ebd18/en/. Up-dated 2010. Accessed January 23, 2018.
 19. Matt GE, Quintana PJ, Zakarian JM, et al. When smokers move out and non-smokers move in: residential third hand smoke pollution and exposure. *Tob Control.* 2011;20:e1.
 20. US Department of Homeland Security, US Fire Administration. Smoking-related fires in residential buildings 2008–2010. <https://www.usfa.fema.gov/downloads/pdf/statistics/v13i6.pdf>. Accessed July 19, 2018.
 21. New York City Housing Preservation & Development. Healthy homes NYC. <http://www1.nyc.gov/site/hpd/developers/healthy-homes.page>. Up-dated 2018. Accessed April 16, 2018.
 22. New York City Housing Preservation & Development. Enterprise Green Communities Criteria. <http://www1.nyc.gov/site/hpd/developers/enterprise-green-communities.page>. Up-dated 2015. Accessed April 16, 2018.
 23. Tenants’ Rights Guide—New York State Attorney General. https://ag.ny.gov/sites/default/files/tenants_rights.pdf. Up-dated 2018. Accessed July 1, 2018.
 24. New York City Department of Housing Preservation and Development. Selected initial findings of the 2017 New York City housing and vacancy survey. <https://www1.nyc.gov/assets/hpd/downloads/pdf/about/2017-hvs-initial-findings.pdf>. Up-dated 2018. Accessed June 27, 2018.
 25. King BA, Peck RM, Babb SD. National and state cost savings associated with prohibiting smoking in subsidized and public housing in the United States. *Prev Chronic Dis.* 2014;11:E171.
 26. NYC Smoke-Free Living. Making your building smoke-free: a guide for landlords & managing agents. <http://www1.nyc.gov/assets/doh/downloads/pdf/epi/sm-free-bro.pdf>. Up-dated 2012. Accessed June 18, 2018.
 27. American Nonsmokers’ Rights Foundation (ANRF). The benefits of smokers buildings: why a smoke-free policy is a good decision for multiunit housing providers. <https://no-smoke.org/benefits-of-smokefree-buildings-fact-sheet/>
 28. Hewett MJ, Ortland WH, Brock BE, et al. Secondhand smoke and smoke-free policies in owner-occupied multiunit housing. *Am J Prev Med.* 2012;43:S187–S196.
 29. Krieger J, Higgins DL. Housing and health: time again for public health action. *Am J Public Health.* 2002;92:758–768.
 30. King BA, Babb SD, Tynan MA, et al. National and state estimates of second-hand smoke infiltration among U.S. multiunit housing residents. *Nicotine Tob Res.* 2013;15:1316–1321.
 31. Live Smoke Free. An apartment managers guide to adopting a smoke-free building policy in the United States. http://www.mnsmokefreehousing.org/documents/national_owner_booklet_readable_spreads.pdf. Up-dated 2012. Accessed July 19, 2018.
 32. Max W, Sung HY, Shi Y. Deaths from secondhand smoke exposure in the United States: economic implications. *Am J Public Health.* 2012;102:2173–2180.
 33. Levy DE, Rigotti NA, Winickoff JP. Tobacco smoke exposure in a sample of Boston public housing residents. *Am J Prev Med.* 2013;44:63–66.
 34. NYC Smoke-Free Public Health Solutions. Smoking disclosure—5 things to know about NYC’s new law. <http://nycsmokefree.org/article/smoking-disclosure>. Up-dated 2018. Accessed September 30, 2018.