

# Secondhand Smoke and Smokefree Policies in Owner-Occupied Multi-Unit Housing

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**Background:** Studies have documented movement of secondhand smoke (SHS) between units in multi-unit buildings, but none has focused on owner-occupied units in common-interest communities (CICs). In Minnesota, approximately 170,000 households (8%) live in such units. CIC households may experience long-term SHS exposure because owner-occupants typically live in the same unit for many years.

**Purpose:** This study estimated the prevalence of SHS incursion in CICs and assessed residents' attitudes toward SHS incursions and interest in smokefree policies.

**Methods:** A stratified sample of Minnesota CIC owner-occupants was surveyed in 2009, with analysis in 2010–2011. Data were weighted to account for differing sampling, response, and coverage rates by stratum, then calibrated to population control totals for housing type, age, and smoking status.

**Results:** The response rate was 35.6%, with 495 completions. Twenty-eight percent of households reported SHS incursion into their unit in the preceding 6 months; 59% of these said this bothers them a lot. Only 6% report that their CIC has a smokefree policy for residents' units. Forty-two percent would prefer such a policy whereas 26% would prefer smoking-permitted. Sixty-three percent definitely and 17% probably would choose a no-smoking building over a smoking-permitted building if they were buying a new unit, and 46% would be willing to pay more for such a unit.

**Conclusions:** Secondhand smoke incursion is common in CICs, and interest in smokefree CICs greatly exceeds the supply. Given the known health risks of SHS exposure, tobacco control efforts in multi-housing should address CICs as well as rental households.

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## Introduction

Exposure to secondhand smoke (SHS) causes numerous adverse health effects,<sup>1–3</sup> with any exposure posing some risk.<sup>4</sup> Exposure in the home is of particular concern because Americans spend 69% of their time in residences.<sup>5</sup> People who live in multi-unit buildings may experience incursions of SHS from other units and therefore be exposed even if they do not allow smoking in their own unit: research has documented both bulk air transfer<sup>6–12</sup> and transfer of SHS constituents<sup>6,13–15</sup> between units.

In surveys of renters or of all residents of multi-housing, 36% to 53% have reported SHS incursion.<sup>16–21</sup>

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Half to three quarters have expressed a preference for smokefree policies, although only a small minority live in buildings having such policies.

Almost half of the U.S. population is protected by smoking bans in workplaces and restaurants and bars,<sup>22</sup> but only a few U.S. communities ban smoking in multi-housing.<sup>23</sup> Efforts to promote voluntary smokefree policies in rental housing have increased over the past 15 years, with 37 U.S. states and five countries now represented on the Smokefree Housing-Talk listserv (J. Bergman, Smokefree Environments Law Project, personal communication, July 19, 2012) and governmental agencies recently encouraging smokefree policies.<sup>24–28</sup> But little work has focused on common-interest communities (CICs).

Common-interest communities include condominiums, cooperatives, and planned communities. Over 5 million U.S. households live in CICs.<sup>29</sup> CIC household income is lower than single-family homeowners', but higher than renters'.<sup>29</sup> CIC households are more likely than single-family homeowners but less likely than rent-

ers to be minorities.<sup>29</sup> Approximately 170,000 Minnesota households (8%) are owner-occupants of CICs in multi-housing. These households face different considerations than renters in dealing with SHS incursion. They live in their units—and may be exposed—substantially longer on average. Moving to avoid exposure often entails selling the unit. Implementing smokefree policies requires approval by the homeowners' association or its board.<sup>23</sup>

In 2008, there were no available surveys focusing on SHS in CICs in the scientific literature. This research sought to fill that gap. Key objectives were to quantify the frequency and severity of SHS incursions, estimate the percentage of units covered by smokefree policies, and assess interest in and barriers to adoption of smokefree policies. Such information can help to gauge the need for policy initiatives and identify barriers they may face.

## Methods

### Population and Samples

Common-interest community owner-occupants present challenges for survey research both in characterizing the population and in identifying suitable sampling frames. The best available population data come from the U.S. Census Bureau's American Community Survey. The 2008 Integrated Public Use Microdata Series,<sup>30</sup> a 1% sample of this survey, was used to estimate the number of owner-occupied CIC households in multi-housing and their distribution by housing subtype and householder age. These data showed that there were 190,000 owner-occupied units in multi-housing in Minnesota in 2008. The number of these in CICs is harder to estimate. The Survey asked<sup>31</sup> whether the unit is part of a condominium, but did not ask about cooperatives or planned communities. Considering only condominiums, the estimated population would be 120,000 households. Beyond CICs, though, the only other common owner-occupants in multi-housing are landlords who live in their own building. The number of units occupied by landlords was estimated retrospectively at 20,000 based on data from the present survey's screening questions and on extrapolation of data from the largest county's property tax records to the state as a whole, resulting in a best estimate of 170,000 owner-occupied CIC units in multi-housing.

Sixty-four percent of self-declared condominium owner-occupants and 66% of all owner-occupants in multi-housing live in single-family attached housing (e.g., townhouses, row houses, twin homes, quad homes) and the rest live in apartment-style buildings.<sup>30</sup> These two housing types differ in potentially relevant ways and thus were treated as separate subpopulations in sampling and analysis. On average, attached units share boundaries with fewer other units than do apartment-style units. They are less susceptible to air transfer driven by stack effect<sup>6</sup> and less likely to be in buildings having common spaces. They are more likely to have individual attached garages, from which SHS may intrude into neighboring units.

To reach the population cost-effectively, samples were drawn from two non-overlapping lists maintained by InfoUSA.com, an information reseller. InfoUSA.com compiles data from multiple sources and uses proprietary algorithms to impute values for some variables—such as ownership status and multi- or single-unit

status—when they are missing. The first list is classified by InfoUSA as owner-occupants of multi-family dwelling units (MFDUs) and the second as owner-occupants of single-family dwelling units (SFDUs). The latter consists primarily of single-family *detached* units not in the target population but also includes some single-family *attached* units in CICs. Using the MFDU sampling frame enabled the project to survey more households with the available budget, reducing sampling error, whereas using the SFDU frame enabled the project to sample the substantial fraction of CIC households in attached units having separate street addresses (i.e., no unit designation), reducing noncoverage error.<sup>32,33</sup> These sampling frames were retrospectively estimated to provide about 38% coverage of the target population.

Of those screened, 47.9% of households on the MFDU sampling frame and 3.3% of those on the SFDU sampling frame were in the target population. Most ineligible households were in single-family *detached* houses or mobile homes (MFDU 35.7%, SFDU 90.4%), were not a primary residence (MFDU 3.6%, SFDU 5.0%), were renters (MFDU 7.4%, SFDU 0.6%) or owned the entire building (MFDU 4.5%, SFDU 0.6%).

### Data Collection

The MFDU sample was surveyed by mail (three mailings) with telephone follow-up. The SFDU sample was surveyed exclusively by telephone, to screen out ineligible households while obtaining information needed to limit confounding of ineligibility with nonresponse. The potential for mode effects<sup>34</sup> was managed by following Census Bureau guidelines.<sup>35</sup> Interviews were completed by experienced interviewers using computer-assisted telephone interviewing software. Up to eight attempts were made at different times of day. Messages requesting a call-back were left on the third and fifth calls. Interviews were completed with any adult of the household.

The survey instrument drew from previous research with renters<sup>16</sup> and input from a project advisory committee. Pretests were completed by mail and phone. Data were collected from January 6 to March 6, 2009. The study was determined to be exempt by the IRB at the University of Minnesota.

### Measures

**Screening, demographic, and housing variables.** Screening questions eliminated housing units that were not the primary residence, single-family detached houses, mobile homes, renters, landlords, and households in a unit less than 6 months. Demographic and housing variables included respondent age, ethnicity, number of people and children in the household, income, housing subtype, number of units in the building, whether the unit has a private patio, deck, or balcony, and whether it has underground or attached parking.

**Smoking status and household smoking policies.** Respondents were considered current smokers if they had smoked at least 100 cigarettes in their lifetime and now smoke every day or some days, and nonsmokers otherwise. The survey also asked how many of the people living in the unit smoke and whether they allow smoking in their unit, on their unit's patio, deck, or balcony, and in their unit's attached garage.

**Secondhand smoke incursions and related attitudes.** Respondents were asked how often tobacco smoke from somewhere else in or around the building has come into their unit in the past 6

months and in the past week, how much this bothers them, and where they think the smoke comes from. They also were asked how often tobacco smoke has come onto their unit's patio, deck, or balcony in the past 6 months and how much this bothers them.

Respondents were asked whether they would try to sell their unit if tobacco smoke came in at various frequencies; whether they would buy a unit if they found out smoke came in at these frequencies; and how much they thought it would affect their unit's resale value if potential buyers knew smoke came in at these frequencies.

Respondents were asked on a 5-point scale whether they agreed or disagreed with several statements about SHS incursions, including (1) whether sellers should be required to disclose how often tobacco smoke comes into the unit they are selling; (2) whether buyers have a right to know how often this occurs; and (3) whether it is important for their unit to be free of tobacco smoke from other units.

**Association smoking policies and policy preferences.** Respondents were asked what rules their association currently has about smoking in several areas and what rules they would prefer to have for each area. They also were asked whether they would choose a "no smoking" or "smoking permitted" building if they were buying a new unit and the buildings were otherwise identical, and whether they would be willing to pay more (and what percentage more) for a unit in a no smoking building, all other things being equal.

Respondents were asked whether they agreed or disagreed with several statements related to CIC association smoking policies, including statements addressing smokers' rights, associations' rights, "grandfathering" of existing smokers, and the impact of smokefree policies on resale value.

## Data Analyses

Data were weighted prior to analysis in 2010–2011. Initial weights were applied to account for the different sampling rates and response rates of the MFDU and SFDU sampling frames. These weights were then adjusted to account for differences in coverage rates for the two frames based on published comparisons between the InfoUSA databases and the U.S. Census Bureau Master Address File.<sup>36</sup>

These adjusted weights were then calibrated to estimated population control totals for housing type (attached, apartment-style) and respondent age (15–44, 45–64, ≥65) from the 2008 American Community Survey<sup>30</sup> and for smoking status (current smoker, nonsmoker) by age category from the 2007 Minnesota Adult Tobacco Survey.<sup>37</sup> These calibration variables were chosen because they identify important study domains; are related to important study variables or response propensity<sup>38</sup>; were available for most respondents (100%, 95.6%, and 98.9%, respectively); and could be reasonably imputed for the remainder. Weights were raked to marginal control totals<sup>39</sup> using the raking module of PASW 18.0.2 (SPSS, Inc). The resulting weights did not exceed typical thresholds for trimming<sup>40–43</sup> and were not trimmed. Data were analyzed using the Complex Samples module of PASW 18.0.2.<sup>44</sup> Differences were conservatively considered to be significant if the 95% CIs did not overlap.

## Results

A total of 495 surveys were completed (319 mail, 176 phone). The response rate<sup>45</sup> was 35.6% (MFDU 61.5%, SFDU 28.2%). Demographic and housing characteristics are summarized in Table 1.

## Smoking Status and Household Smoking Policies

Seven and a half percent of respondents were smokers; after population weighting, these account for 14.9% of the adult CIC population. This compares with 17% for adult Minnesotans as a whole in 2007.<sup>37</sup>

Nineteen percent of households (95% CI=16.1%, 22.3%) have one or more occupants who smoke, and this does not differ significantly between those in attached units (17.2%, 95% CI=13.1%, 22.3%) and apartment-style units (22.5%, 95% CI=20.0%, 25.1%). Twenty percent allow smoking in their unit (95% CI=16.2%, 23.5%), with households in apartment-style units significantly more likely to allow it (29.0%, 95% CI=22.1%, 37.1%) than those in attached units (14.6%, 95% CI=11.1%, 19.0%). Most households have a private patio, deck, or balcony and 56% of these allow smoking there (95% CI=50.5%, 62.1%). Seventeen percent of households having an attached garage allow smoking there (95% CI=11.9%, 24.2%).

## Secondhand Smoke Incursions and Related Attitudes

Twenty-eight percent of households report having had tobacco smoke come into their unit from somewhere else in the preceding 6 months, and 11% in the past week (Table 2). Fifty-nine percent say this bothers them a lot (Table 3). These households most commonly think the smoke comes from another resident's patio, deck, or balcony (46.4%, 95% CI=35.0%, 58.2%) or from another resident's unit (37.3%, 95% CI=25.8%, 50.5%), with outdoor and indoor common areas less often mentioned (multiple responses allowed). Households in attached units also identify other residents' garages as a common source.

Among those who have private patios, decks, or balconies, 40.1% have had SHS come onto it from somewhere else in the preceding 6 months (Table 2). Twenty-eight percent say this bothers them a lot (Table 3).

Seventy-eight percent agree that it is important to them for their unit to be free of tobacco smoke from other units (95% CI=73.8%, 82.1%) whereas 10% disagree (95% CI=7.0%, 14.3%). Half would not buy a unit if smoke came into it 1 day per week (Table 4). Sixty-one percent think SHS incursion 1 day per week would decrease the resale value of their unit if the buyer knew about it (95% CI=55.5%, 66.6%), whereas 19% think it would have no effect (95% CI=14.4%, 24.7%) and 20% don't know (95% CI=15.9%, 24.3%). Seventy-five percent agree that buyers have a right to know how often smoke from other units comes into a unit they are considering buying (95% CI=68.7%, 79.5%), but only 61.5% agree that sellers should be required to disclose this (95% CI=55.2%, 67.3%).

**Table 1.** Demographic and housing characteristics, population-weighted percent (CI)

|   | Attached          | Apartment-style   | All               |
|---|-------------------|-------------------|-------------------|
| <b>Age, years<sup>a</sup> (n)</b>                   | 226               | 269               | 495               |
| 15–44   | 35.7 (NA)         | 34.6 (NA)         | 35.3 (NA)         |
| 45–64   | 34.9 (NA)         | 36.2 (NA)         | 35.3 (NA)         |
| ≥65   | 29.4 (NA)         | 29.2 (NA)         | 29.4 (NA)         |
| <b>Spanish, Hispanic, or Latino (n)</b>             | 223               | 265               | 488               |
| Yes   | 2.5 (0.8, 7.4)    | 4.1 (1.0, 15.3)   | 3.1 (1.3, 7.2)    |
| No  | 97.5 (92.6, 99.2) | 95.9 (84.7, 99.0) | 96.9 (92.8, 98.7) |
| <b>Race (n)</b>                                     | 221               | 263               | 484               |
| American Indian or Alaska Native                    | 0.3 (0.0, 1.9)    | 0.0 (—)           | 0.2 (0.0, 1.2)    |
| Asian   | 1.4 (0.3, 7.1)    | 1.1 (0.2, 7.3)    | 1.3 (0.4, 4.7)    |
| Black or African American                           | 2.6 (0.7, 8.8)    | 0.7 (0.2, 2.3)    | 1.9 (0.6, 5.8)    |
| White   | 93.6 (87.1, 96.9) | 95.6 (90.2, 98.1) | 94.3 (89.9, 96.8) |
| Other   | 0.0 (—)           | 2.6 (0.9, 7.7)    | 0.9 (0.3, 2.7)    |
| Multiple races                                      | 2.2 (0.6, 7.3)    | 0.0 (—)           | 1.4 (0.4, 4.9)    |
| <b>Total people in household (n)</b>                | 223               | 255               | 478               |
| 1   | 35.6 (29.0, 42.8) | 64.9 (57.2, 72.0) | 45.4 (40.1, 50.8) |
| 2   | 42.9 (35.6, 50.5) | 29.9 (23.3, 37.3) | 38.5 (33.2, 44.2) |
| 3   | 16.9 (11.6, 23.8) | 4.3 (1.8, 10.0)   | 12.7 (9.0, 17.5)  |
| ≥4  | 4.7 (2.1, 9.8)    | 0.9 (0.1, 6.5)    | 3.4 (1.7, 6.9)    |
| <b>Any children in household (n)</b>                | 225               | 263               | 488               |
| No  | 80.2 (73.0, 85.8) | 92.8 (86.9, 96.2) | 84.5 (79.5, 88.5) |
| Yes   | 19.8 (14.2, 27.0) | 7.2 (3.8, 13.1)   | 15.5 (11.5, 20.5) |
| <b>Yearly household income before taxes, \$ (n)</b> | 179               | 219               | 398               |
| ≤34,999   | 24.3 (18.0, 31.8) | 23.2 (17.8, 29.5) | 23.9 (19.3, 29.2) |
| 35,000–49,999                                       | 16.4 (11.2, 23.3) | 22.8 (15.0, 33.0) | 18.5 (14.0, 24.1) |
| 50,000–74,999                                       | 27.8 (20.5, 36.6) | 20.3 (15.0, 26.9) | 25.3 (20.0, 31.4) |
| ≥75,000   | 31.5 (24.0, 40.2) | 33.8 (24.8, 44.1) | 32.3 (26.3, 38.9) |
| <b>Type of housing<sup>a</sup> (n)</b>              | 226               | 269               | 495               |
| Single-family attached                              | 100.0 (NA)        | 0.0 (NA)          | 65.6 (NA)         |
| Apartment-style                                     | 0.0 (NA)          | 100.0 (NA)        | 34.4 (NA)         |
| <b>Number of units in building (n)</b>              | 218               | 250               | 468               |
| ≤4  | 44.8 (37.5, 52.4) | 4.3 (2.0, 9.0)    | 31.5 (26.6, 36.8) |
| 5–9   | 32.7 (25.5, 40.8) | 9.6 (6.1, 14.8)   | 25.1 (20.1, 30.8) |
| 10–19   | 10.1 (6.0, 16.6)  | 8.1 (3.5, 17.7)   | 9.4 (6.1, 14.4)   |
| 20–49   | 4.6 (2.5, 8.3)    | 24.8 (18.8, 32.0) | 11.3 (8.7, 14.5)  |
| ≥50   | 7.8 (4.3, 13.7)   | 53.2 (44.0, 62.2) | 22.7 (18.7, 27.4) |
| <b>Private patio, deck, balcony on unit (n)</b>     | 222               | 263               | 485               |
| Yes   | 89.4 (83.0, 93.6) | 86.6 (80.2, 91.2) | 88.5 (84.0, 91.9) |

(continued on next page)

Table 1. (continued)

|  | Attached          | Apartment-style   | All               |
|--|-------------------|-------------------|-------------------|
| No   | 9.4 (5.6, 15.4)   | 13.4 (8.9, 19.8)  | 10.8 (7.6, 15.0)  |
| Don't know                                 | 1.2 (0.2, 7.8)    | 0.0 (—)           | 0.7 (0.1, 5.3)    |
| <b>Underground or attached parking (n)</b> | <b>226</b>        | <b>266</b>        | <b>492</b>        |
| Yes  | 49.1 (41.8, 56.6) | 73.1 (64.2, 80.5) | 57.4 (51.6, 62.9) |
| No   | 49.7 (42.5, 57.0) | 26.9 (19.5, 35.8) | 41.9 (36.5, 47.6) |
| Don't know                                 | 1.1 (0.2, 7.7)    | 0.0 (—)           | 0.8 (0.1, 5.2)    |

Note: n, unweighted number of respondents

<sup>a</sup>Raked to control totals.<sup>39</sup> CIs not applicable.

NA, not applicable

### Association Smoking Policies and Policy Preferences

A majority report that their CIC has smokefree policies for indoor common areas but few report smokefree policies for other areas (Table 5). For each area, more people prefer no-smoking policies than smoking-permitted policies.

If buying a new unit, 63.1% would definitely choose a no-smoking building (95% CI=57.8%, 68.1%) and 16.4% would probably do so (95% CI=12.1%, 21.8%). Twelve percent would

definitely or probably choose a smoking-permitted building (95% CI=8.7%, 16.3%). Forty-six percent would be willing to pay more for a unit in a no-smoking building (95% CI=40.4%, 51.3%). Owners are more likely to think a smokefree policy would increase the resale value of their unit than decrease it (Table 6).

Common-interest community owner-occupants are about evenly split on whether smokers should have a right to smoke in various areas even if their smoke gets into others' spaces or

Table 2. Prevalence of secondhand smoke incursions, population-weighted percent (CI)<sup>a</sup>

| In the past 6 months, how often has tobacco smoke from somewhere else in or around the building come. . . |     |                   |                   |                   |                 |                  |
|---|-----|-------------------|-------------------|-------------------|-----------------|------------------|
|   | n   | Never             | Rarely            | Sometimes         | Often           | Most of the time |
| <b>Into your unit?</b>  |     |                   |                   |                   |                 |                  |
| All   | 488 | 72.2 (66.5, 77.3) | 12.6 (9.2, 17.0)  | 9.7 (6.4, 14.4)   | 3.4 (1.6, 6.9)  | 2.2 (1.0, 5.0)   |
| Nonsmokers  | 452 | 69.7 (63.6, 75.2) | 14.8 (10.8, 20.0) | 9.0 (5.8, 13.6)   | 4.0 (1.9, 8.1)  | 2.6 (1.1, 5.9)   |
| Smokers   | 36  | 86.4 (64.4, 95.7) | 0.0 (—)           | 13.6 (4.3, 35.6)  | 0.0 (—)         | 0.0 (—)          |
| <b>Onto your unit's patio, deck, or balcony?<sup>b</sup></b>  |     |                   |                   |                   |                 |                  |
| All   | 427 | 59.9 (53.2, 66.3) | 18.5 (14.3, 23.7) | 15.9 (11.3, 21.8) | 3.9 (1.8, 8.4)  | 1.8 (0.6, 5.2)   |
| Nonsmokers  | 397 | 58.1 (51.3, 64.6) | 20.4 (15.6, 26.3) | 16.1 (11.4, 22.2) | 3.3 (1.5, 7.2)  | 2.1 (0.7, 6.1)   |
| Smokers   | 30  | 70.3 (44.4, 87.5) | 7.8 (2.5, 22.0)   | 14.8 (4.6, 38.7)  | 7.1 (0.9, 38.8) | 0.0 (—)          |
| In the past week, how many days has tobacco smoke from somewhere else in or around the building come. . . |     |                   |                   |                   |                 |                  |
|   | n   | None              | 1 day             | 2-4 days          | 5-6 days        | 7 days           |
| <b>Into your unit?</b>  |     |                   |                   |                   |                 |                  |
| All   | 492 | 89.1 (84.7, 92.4) | 2.8 (1.3, 6.0)    | 5.3 (3.0, 9.2)    | 0.4 (0.1, 2.2)  | 2.3 (1.2, 4.3)   |
| Nonsmokers  | 455 | 88.1 (83.0, 91.8) | 3.3 (1.5, 7.0)    | 5.9 (3.3, 10.4)   | 0.5 (0.1, 2.6)  | 2.2 (1.2, 4.2)   |
| Smokers   | 37  | 95.3 (82.3, 98.9) | 0.0 (—)           | 2.0 (0.3, 13.3)   | 0.0 (—)         | 2.7 (0.4, 17.2)  |

Note: n, unweighted number of respondents

<sup>a</sup>Differences by housing type for all respondents not significant (differences by housing type within nonsmoker and smoker groups not tested)

<sup>b</sup>Limited to those who did not say "not applicable, I don't have one" and who indicated in response to another question that their unit had a patio, deck, or balcony

**Table 3.** Extent to which people are bothered by secondhand smoke incursions, population-weighted percent (CI)<sup>a</sup>

| How much does it bother you when tobacco smoke from somewhere else in or around the building comes. . . |          |                   |                   |                   |                   |
|---|----------|-------------------|-------------------|-------------------|-------------------|
|   | <i>n</i> | Not at all        | A little          | Some              | A lot             |
| <b>Into your unit?</b>  |          |                   |                   |                   |                   |
| All   | 114      | 10.7 (8.2, 13.9)  | 15.4 (8.2, 27.2)  | 15.4 (8.8, 25.4)  | 58.6 (47.3, 69.0) |
| Nonsmokers  | 110      | 4.4 (2.2, 8.7)    | 15.4 (7.7, 28.4)  | 16.7 (9.5, 27.5)  | 63.5 (50.9, 74.5) |
| Smokers   | 4        | 84.9 (NA)         | 15.1 (NA)         | 0.0 (—)           | 0.0 (—)           |
| <b>Onto your unit's patio, deck, or balcony?</b>  |          |                   |                   |                   |                   |
| All   | 168      | 33.3 (25.2, 42.7) | 25.3 (17.4, 35.3) | 13.3 (9.2, 19.0)  | 28.0 (20.0, 37.8) |
| Nonsmokers  | 160      | 26.5 (18.1, 37.0) | 27.4 (18.6, 38.3) | 14.9 (10.2, 21.2) | 31.3 (22.3, 42.0) |
| Smokers   | 8        | 92.1 (NA)         | 7.9 (NA)          | 0.0 (—)           | 0.0 (—)           |

Note: *n*, unweighted number of respondents

<sup>a</sup>Limited to those experiencing incursions in the past 6 months. Differences by housing type for all respondents not significant except apartment-style more likely to say smoke coming into unit does not bother them at all (16.5, 95% CI=12.5, 21.4) than attached (7.4, 95% CI=4.5, 12.0). (Differences by housing type within nonsmoker and smoker groups not tested.)

NA, not applicable

bothers others, and on whether associations should have a right to adopt rules prohibiting smoking. A majority agree that if a smokefree policy is adopted, smokers who already live in the building should be allowed to continue to smoke until they sell the unit or move out (Table 6).

### Apartment-Style Versus Attached Housing

Contrary to expectations, few differences between apartment-style and attached housing were significant (see footnotes, Tables 2–6). In particular, those in attached housing were no less likely to report SHS incursions than those in apartment-style housing.

### Smokers Versus Nonsmokers

Differences between smokers and nonsmokers were not tested for all variables because the small total sample size and

the low percentage of smokers in the population and the sample limited the power of tests of differences. Current smokers are significantly more likely to allow smoking in their unit than are nonsmokers (68.1% vs 11.0%). They are significantly less likely to report SHS incursions into their unit in the past 6 months (Table 2) and more likely to say these do not bother them at all (Table 3). They are more likely to prefer smoking-permitted policies for their current CIC (Table 5) and would be more likely to choose a smoking-permitted CIC if they were buying a new unit (50.6% vs 5.2%).

### Discussion

To our knowledge, this is the first survey focusing in depth on SHS incursion and smokefree policy issues in

**Table 4.** Effect of secondhand smoke incursions on purchase and sale decisions, population-weighted percent (CI)<sup>a</sup>

|   | <i>n</i> | Yes               | No                | Don't know        |
|---|----------|-------------------|-------------------|-------------------|
| <b>If you were considering buying a particular unit, would you still buy it if you found out that tobacco smoke came in 1 day per week?</b> |          |                   |                   |                   |
| All   | 481      | 30.3 (25.1, 35.9) | 50.2 (44.8, 55.6) | 19.5 (14.9, 25.2) |
| Nonsmokers  | 445      | 24.3 (19.1, 30.4) | 56.5 (50.2, 62.5) | 19.2 (14.4, 25.2) |
| Smokers   | 36       | 64.6 (47.1, 78.9) | 14.3 (7.2, 26.3)  | 21.1 (9.4, 41.0)  |
| <b>Would you try to sell your unit if tobacco smoke came in 1 day per week?</b>   |          |                   |                   |                   |
| All   | 475      | 40.8 (34.9, 46.9) | 33.3 (27.9, 39.1) | 26.0 (21.2, 31.4) |
| Nonsmokers  | 440      | 41.0 (34.9, 47.4) | 31.9 (26.3, 38.0) | 27.1 (21.9, 33.1) |
| Smokers   | 35       | 39.3 (22.9, 58.5) | 41.3 (26.5, 58.0) | 19.4 (9.9, 34.6)  |

Note: *n*, unweighted number of respondents

<sup>a</sup>Differences by housing type for all respondents not significant. (Differences by housing type within nonsmoker and smoker groups not tested.)

**Table 5.** Current and preferred association smoking policies, population-weighted percent (CI)

|  | Corridors, stairways,<br>and lobbies <sup>a</sup> | Outdoor common<br>areas <sup>a,b</sup> | Residents' units  | Residents' patios, decks,<br>and balconies <sup>c</sup> |
|--|---|--|-------------------|---|
| <b>WHAT RULES DOES YOUR ASSOCIATION CURRENTLY HAVE ABOUT SMOKING IN EACH OF THE FOLLOWING AREAS?<sup>d</sup></b> |   |  |                   |   |
| <b>All (n)</b>   | 335   | 432                                    | 472               | 413   |
| Smoking is permitted   | 21.9 (15.6, 29.8)                                 | 67.1 (61.4, 72.3)                      | 76.5 (71.0, 81.2) | 77.8 (72.2, 82.5)                                       |
| Smoking is not permitted   | 59.9 (52.3, 67.0)                                 | 12.2 (8.9, 16.7)                       | 6.1 (3.8, 9.6)    | 6.9 (4.1, 11.5)   |
| Don't know   | 18.3 (13.1, 24.8)                                 | 20.7 (16.5, 25.6)                      | 17.5 (13.4, 22.4) | 15.3 (11.6, 19.9)                                       |
| <b>WHAT RULES WOULD YOU PREFER TO HAVE ABOUT SMOKING IN EACH OF THESE AREAS?<sup>e</sup></b>                     |   |  |                   |   |
| <b>All (n)</b>   | 314   | 429                                    | 472               | 414   |
| Strongly prefer smoking permitted  | 5.8 (2.6, 12.5)                                   | 16.9 (12.3, 22.9)                      | 19.7 (15.1, 25.3) | 22.2 (16.8, 28.8)                                       |
| Somewhat prefer smoking permitted  | 0.2 (0.0, 1.4)                                    | 5.0 (3.2, 7.7)                         | 6.2 (3.8, 10.1)   | 6.4 (3.9, 10.3)   |
| No preference  | 12.0 (7.5, 18.7)                                  | 32.8 (3.2, 7.7)                        | 32.4 (3.8, 10.1)  | 30.7 (25.2, 36.9)                                       |
| Somewhat prefer smoking not permitted  | 8.3 (5.0, 13.5)                                   | 12.6 (27.2, 38.9)                      | 13.5 (26.9, 38.3) | 12.4 (9.0, 17.0)  |
| Strongly prefer smoking not permitted  | 73.7 (66.4, 79.9)                                 | 32.8 (9.3, 16.8)                       | 28.3 (9.9, 18.0)  | 28.3 (22.8, 34.4)                                       |
| <b>Nonsmokers (n)</b>  | 287   | 395                                    | 435               | 383   |
| Strongly prefer smoking permitted  | 5.8 (2.4, 13.3)                                   | 10.9 (7.0, 16.7)                       | 14.9 (10.5, 20.7) | 14.6 (10.0, 20.9)                                       |
| Somewhat prefer smoking permitted  | 0.2 (0.0, 1.7)                                    | 4.9 (3.1, 7.6)                         | 5.5 (3.3, 9.0)    | 6.3 (4.1, 9.6)  |
| No preference  | 10.7 (6.0, 18.2)                                  | 34.0 (27.9, 40.8)                      | 33.5 (27.8, 39.8) | 33.5 (27.4, 40.2)                                       |
| Somewhat prefer smoking not permitted  | 7.8 (4.3, 13.9)                                   | 14.4 (10.5, 19.3)                      | 14.5 (10.8, 19.1) | 14.1 (10.1, 19.4)                                       |
| Strongly prefer smoking not permitted  | 75.5 (66.8, 82.5)                                 | 35.8 (29.6, 42.4)                      | 31.6 (26.1, 37.7) | 31.5 (25.5, 38.1)                                       |
| <b>Smokers (n)</b>   | 27  | 34                                     | 37                | 31  |
| Strongly prefer smoking permitted  | 5.9 (0.8, 33.7)                                   | 50.6 (31.7, 69.3)                      | 45.9 (29.1, 63.7) | 50.6 (31.7, 69.3)                                       |
| Somewhat prefer smoking permitted  | 0.0 (—)   | 5.4 (1.3, 20.2)                        | 10.1 (2.6, 32.1)  | 5.4 (1.3, 20.2)   |
| No preference  | 17.7 (7.6, 35.9)                                  | 25.6 (15.3, 39.7)                      | 25.9 (12.7, 45.8) | 25.6 (15.3, 39.7)                                       |
| Somewhat prefer smoking not permitted  | 10.4 (3.9, 24.7)                                  | 2.3 (0.3, 15.2)                        | 8.2 (1.6, 32.6)   | 2.3 (0.3, 15.2)   |
| Strongly prefer smoking not permitted  | 66.0 (52.8, 77.1)                                 | 16.0 (5.5, 38.4)                       | 9.9 (2.4, 32.9)   | 16.0 (5.5, 38.4)  |

Note: n, unweighted number of respondents

<sup>a</sup>Excludes responses of *Not applicable*. This building doesn't have these.

<sup>b</sup>Item included the further explanation *lawns, parking lots, common patios, roof decks, pools*.

<sup>c</sup>Excludes *Not applicable* responses and respondents who said in a separate question that the property does not have these.

<sup>d</sup>Differences by housing type for all respondents not significant except apartment-style households more likely to report smokefree policy for indoor common areas (83.5, 95% CI=74.7, 89.7) than attached (28.9, 95% CI=18.4, 42.4) and less likely to report smoking-permitted or unknown. (Differences by housing type within nonsmoker and smoker groups not tested.)

<sup>e</sup>Differences by housing type for all respondents not significant except attached more likely to have no preference for indoor and outdoor common areas and patios, decks, or balconies, and apartment-style more likely to strongly prefer smoking not permitted for indoor common areas (85.4, 95% CI=78.7, 90.3) than attached (55.0, 95% CI=40.5, 68.8).

Table 6. Attitudes regarding smoking policies, population-weighted percent (CI)<sup>a</sup>

|   | Group | n   | Agree or strongly agree | Neutral           | Disagree or strongly disagree |
|---|-------|-----|-------------------------|-------------------|-------------------------------|
| People should have a right to smoke in their own units even if their smoke sometimes gets into other people's units.  | All   | 489 | 38.1 (32.8, 43.6)       | 17.8 (13.8, 22.6) | 44.1 (39.0, 49.5)             |
|   | NS    | 452 | 31.8 (26.0, 38.1)       | 19.0 (14.5, 24.4) | 49.2 (43.2, 55.3)             |
|   | S     | 37  | 73.6 (62.1, 82.6)       | 11.1 (4.8, 23.6)  | 15.3 (10.2, 22.4)             |
| People should have a right to smoke on their patio, deck, or balcony even if their smoke sometimes gets onto other people's patios, decks, or balconies.          | All   | 490 | 46.7 (41.2, 52.4)       | 17.3 (13.4, 21.9) | 36.0 (31.1, 41.3)             |
|   | NS    | 454 | 41.7 (35.7, 48.0)       | 17.4 (13.4, 22.3) | 40.9 (35.1, 46.9)             |
|   | S     | 36  | 75.4 (59.8, 86.3)       | 16.3 (7.3, 32.7)  | 8.3 (4.0, 16.6)               |
| People should have a right to smoke in outdoor common areas . . . even if the smoke bothers some other residents.   | All   | 491 | 37.2 (31.5, 43.3)       | 21.1 (16.7, 26.4) | 41.6 (36.2, 47.3)             |
|   | NS    | 454 | 33.3 (27.7, 39.4)       | 19.1 (14.8, 24.3) | 47.6 (41.4, 53.8)             |
|   | S     | 37  | 59.4 (37.8, 77.9)       | 32.4 (17.7, 51.7) | 8.1 (1.7, 31.1)               |
| Associations should have a right to adopt rules prohibiting smoking in residents' units.  | All   | 492 | 47.1 (41.4, 52.9)       | 12.8 (9.3, 17.2)  | 40.1 (34.8, 45.6)             |
|   | NS    | 455 | 52.5 (46.2, 58.7)       | 15.0 (11.0, 20.2) | 32.5 (27.0, 38.6)             |
|   | S     | 37  | 16.9 (6.7, 36.7)        | 0.0 (—)           | 83.1 (63.3, 93.3)             |
| Associations should have a right to adopt rules prohibiting smoking on residents' patios, decks, and balconies.   | All   | 491 | 42.6 (37.3, 48.0)       | 16.1 (12.3, 20.8) | 41.3 (36.0, 46.8)             |
|   | NS    | 454 | 47.6 (41.7, 53.6)       | 18.6 (14.1, 24.0) | 33.8 (28.1, 40.0)             |
|   | S     | 37  | 13.9 (5.7, 29.9)        | 2.0 (0.3, 13.3)   | 84.1 (68.4, 92.8)             |
| Associations should have a right to adopt rules prohibiting smoking in outdoor common areas.  | All   | 490 | 47.5 (41.8, 53.3)       | 16.2 (12.4, 21.0) | 36.2 (30.8, 42.0)             |
|   | NS    | 453 | 52.2 (45.9, 58.4)       | 17.2 (13.2, 22.1) | 30.6 (25.2, 36.6)             |
|   | S     | 37  | 21.0 (9.6, 40.0)        | 10.8 (2.8, 33.2)  | 68.2 (47.5, 83.5)             |
| If associations adopt "No Smoking" rules, they should allow smokers who already live in the building to continue to smoke until they sell their unit or move out. | All   | 490 | 58.5 (53.2, 63.6)       | 18.7 (14.5, 23.8) | 22.8 (18.3, 28.0)             |
|   | NS    | 454 | 52.7 (46.7, 58.6)       | 21.0 (16.2, 26.7) | 26.3 (21.1, 32.4)             |
|   | S     | 36  | 92.1 (79.6, 97.2)       | 5.9 (1.7, 18.3)   | 2.1 (0.3, 13.5)               |
| If associations adopt "No Smoking" rules, they should allow smokers who already live in the building to continue to smoke for a limited period of time.           | All   | 487 | 34.8 (29.3, 40.8)       | 22.9 (18.2, 28.4) | 42.3 (36.5, 48.3)             |
|   | NS    | 453 | 34.1 (28.5, 40.1)       | 24.1 (19.1, 29.8) | 41.9 (35.8, 48.2)             |
|   | S     | 34  | 39.5 (21.3, 61.1)       | 16.0 (5.6, 38.0)  | 44.6 (28.1, 62.3)             |
| If my association adopted a policy prohibiting smoking in residents' units, the resale value of my unit would INCREASE.   | All   | 491 | 37.5 (32.1, 43.2)       | 38.4 (32.8, 44.5) | 24.1 (19.1, 29.8)             |
|   | NS    | 454 | 41.1 (35.2, 47.2)       | 38.4 (32.5, 44.8) | 20.5 (15.7, 26.4)             |
|   | S     | 37  | 17.2 (6.6, 38.0)        | 38.6 (23.0, 57.0) | 44.2 (27.1, 62.8)             |
| If my association adopted a policy prohibiting smoking in residents' units, the resale value of my unit would DECREASE.   | All   | 489 | 14.3 (10.7, 19.0)       | 36.7 (31.1, 42.6) | 49.0 (43.1, 54.9)             |
|   | NS    | 452 | 15.2 (11.1, 20.6)       | 34.8 (29.1, 41.1) | 49.9 (43.8, 56.1)             |
|   | S     | 37  | 9.1 (4.3, 18.3)         | 47.3 (30.6, 64.7) | 43.5 (26.7, 62.0)             |

Note: n, unweighted number of respondents

<sup>a</sup>Differences by housing type for all respondents not significant; (differences by housing type within nonsmoker and smoker groups not tested) NS, nonsmokers; S, smokers

CICs. The prevalence of SHS incursions in owner-occupied CIC households in Minnesota is lower than rates reported in the literature for renters and for all residents of multi-housing. It is higher than the rate for the condominium subset of a survey of Canadians in multi-housing, 15% of whom have ever experienced SHS incursions into their current residence.<sup>20</sup> The fraction of

those experiencing incursions who say this bothers them a lot is higher than reported in other surveys.

The proportion of households that would choose a no-smoking building if they were buying a new unit far exceeds the current supply of smokefree units. Yet many are ambivalent about imposing a no-smoking policy on existing smokers, suggesting that it could be difficult to

persuade existing CICs to go smokefree. It may therefore be beneficial to encourage developers to adopt smokefree policies when CICs are first established.

Research on SHS in CICs is just beginning. This project included legal research<sup>23</sup> and interviews with CIC managers as well as the survey reported here. Additional needs include survey data for more markets, development and testing of best practices to promote adoption of smokefree policies in CICs, and direct measurements of SHS transfer and possibly health outcomes in CICs.

One limitation of this study is that the sampling frames covered only about 38% of the target population. Moreover, the response rate was 36%, so response bias cannot be ruled out. An additional limitation is the lack of oversamples for minorities, young adults, households with children, and low-income households. Given the lack of good sampling frames for this population and the high cost of screening the general population to reach this subset alone, it would be beneficial to add questions about multi-housing to periodic state tobacco surveys that poll large samples for broader purposes, as has been done in New York,<sup>18</sup> but adding some questions specific to owners and renters.

Another limitation of the present study is the reliance on self-reports of SHS incursion based on retrospective recall. In rental housing, measurements of SHS transfer<sup>6,13-15</sup> have helped advocates promote smokefree policies. CIC-specific measurements, especially in attached housing where market actors appear skeptical that transfer occurs, can help to make the case for smokefree CIC policies. The gold standard for support of tobacco control policies is documentation of health effects, and CICs could prove more suitable for this purpose than rental properties, given that the occupants tend to live in CICs longer.

## Conclusion

Eight percent of households in Minnesota are owner-occupants of CIC units in multi-housing. Many experience and are bothered by SHS incursions, and many would prefer smokefree CICs. Given the known harmful effects of SHS, tobacco control efforts in multi-housing should address CIC owner-occupants as well as renters.

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