ABSTRACT

Objectives Given high prevalence of smoking and secondhand smoke exposure in Armenia and Georgia and quicker implementation of tobacco legislation in Georgia versus Armenia, we examined correlates of having no/partial versus complete smoke-free home (SFH) restrictions across countries, particularly smoking characteristics, risk perceptions, social influences and public smoking restrictions.

Design Cross-sectional survey study design.

Setting 28 communities in Armenia and Georgia surveyed in 2018.

Participants 1456 adults ages 18–64 in Armenia (n=705) and Georgia (n=751).

Measurements We used binary logistic regression to examine aforementioned correlates of no/partial versus complete SFH among non-smokers and smokers in Armenia and Georgia, respectively.

Results Participants were an average age of 43.35, 60.5% women and 27.3% smokers. In Armenia, among non-smokers, having no/partial SFHs correlated with being men (OR=2.63, p=0.001) and having more friend smokers (OR=1.23, p=0.002); among smokers, having no/partial SFHs correlated with being unmarried (OR=10.00, p=0.001), lower quitting importance (OR=0.82, p=0.010) and less favourable smoking attitudes among friends/family/public (OR=0.48, p=0.034). In Georgia, among non-smokers, having no/partial SFHs correlated with older age (OR=1.04, p=0.002), being men (OR=5.56, p<0.001), lower SHS risk perception (OR=0.43, p<0.001), more friend smokers (OR=1.49, p=0.002) and fewer workplace (indoor) restrictions (OR=0.51, p=0.026); among smokers, having no/partial SFHs correlated with being men (OR=50.00, p<0.001), without children (OR=5.88, p<0.001), daily smoking (OR=4.30, p=0.050), lower quitting confidence (OR=0.81, p=0.004), more friend smokers (OR=1.62, p=0.038) and fewer community restrictions (OR=0.68, p=0.026).

Strengths and limitations of this study

- This is among the first studies to explore correlates of having no or partial versus complete smoke-free home restrictions in Armenia and Georgia.
- Data from this large diverse sample of adults in Armenia and Georgia are derived from rigorous sampling methods.
- Generalisability of findings is a limitation, as the study sample may not be representative of all adults in these countries.
- The cross-sectional nature and self-reported assessments limit the ability to make causal attributions or account for bias.
- The results could be biased due to several factors, such as unmeasured variables associated with differential participation across countries.

Conclusions Private settings continue to lack smoking restrictions in Armenia and Georgia. Findings highlight the importance of social influences and comprehensive tobacco legislation, particularly smoke-free policies, in changing household smoking restrictions and behaviours.

Trial registration number NCT03447912.

INTRODUCTION

Despite the undeniable evidence that second-hand smoke exposure (SHSe) can lead to various severe diseases such as cancer, cardiovascular and respiratory diseases, SHSe continues to be a significant public health concern worldwide. People experience SHSe in various indoor and outdoor public and private places such as homes, vehicles, workplaces, bars, cafes, restaurants...
It is suggested that comprehensive smoke-free policies help to educate the public about the hazards of SHSe and tend to encourage healthier behaviours. Particularly, many studies conclude that, after implementation of complete restrictions in workplaces and public places, the likelihood of voluntary introduction of smoke-free home (SFH) restrictions increases. Implementation of comprehensive national smoke-free policies is one of the factors changing social acceptability of smoking behaviour and accelerating adoption of SFH restrictions, although a delayed response to such policies.

SFH restrictions are more common among those with children in the home (especially children less than 5 years old) and with non-smoking family members in the home. Increased knowledge and perception of the harms of SHSe are also shown to be associated with more favourable attitudes towards smoke-free environments, better efforts to reduce exposure and adoption of complete SFH restrictions. Indeed, Georgia-based research indicates that, while the majority of adults believe that SHSe is harmful, homes continue to be a primary source of SHSe and common efforts to reduce its impact include partial restrictions (eg, limiting rooms where smoking is allowed). Another relatively less studied factor described in the literature is knowledge and perception of harms of thirdhand smoke exposure, which are associated with stricter SFH and smoke-free car restrictions.

Given that smokers are less likely to implement complete SFH restrictions compared with non-smokers, countries with high prevalence of men smoking such as Armenia and Georgia are at greater risk of SHSe in private settings. Additionally, considering that both countries have introduced comprehensive smoke-free policies rather recently (Georgia relatively earlier than Armenia), SHSe in private settings in Armenia and Georgia remains a prominent issue. The extent to which people in Armenia and Georgia perceive the impacts of SHSe and THSe as harmful may limit the extent to which they are likely to implement SFH restrictions. Moreover, understanding the home context, the nuanced nature of who has implemented complete SFH restrictions versus partial or no restrictions, places in the home where smoking is most likely to be allowed, who are the main sources of the exposure in homes, and how family members discuss and negotiate SFH policies are critical to informing SFH interventions.

Accordingly, the current study examined correlates of having no or partial versus complete SFH restrictions among non-smokers and smokers in 28 communities across Armenia and Georgia within the context of a community randomised controlled trial (RCT) examining the impact of local coalitions promoting smoke-free air. This study draws from a socioecological framework, which highlights multilevel influences on health outcomes, including individual-level, interpersonal, community-level and policy-level factors. In this study, we are analysing data from Armenia and Georgia...
separately to account for the policy-level differences in public smoke-free restrictions. Among survey participants in each country, we explored (1) individual factors (ie, sociodemographics, tobacco use characteristics, tobacco-related risk perceptions), (2) interpersonal factors (ie, social influences) and (3) community-level factors (ie, exposure to smoking restrictions in one’s community—at work, in restaurants/bars) as correlates of SFH status. We further characterise the nature of SFH restrictions as well as household vehicle restrictions and SHSe across SFH restriction levels.

METHODS
Ongoing study overview
The Institutional Review Boards of Emory University (IRB00097093), the National Academy of Sciences of the Republic of Armenia (IRB00004079), the American University of Armenia (AUA-2017–013) and the National Center for Disease Control and Public Health of Georgia (IRB0002150) approved this study. The ongoing parent study is more fully described elsewhere and briefly described here. This study uses a matched-pairs community RCT to examine the effectiveness of local coalitions in promoting smoke-free air and reducing SHSe in Armenia and Georgia. We purposively selected 14 ‘communities’ (ie, municipalities) per country with small to medium populations. Communities were paired in each country based on region (and distance from Yerevan or Tbilisi), population size and local public health branch/centre budget, then randomly assigned to intervention versus control conditions.

Data collection
Among all 28 intervention and control communities, population-level surveys (ie, of community member) were conducted before the launch of the coalition member trainings (October–November 2018) and then will be conducted at the culmination of coalition activity (Spring 2022). Current analyses focus on baseline population-level surveys conducted in October–November 2018. The target sample size was 50 surveys/community in order to address the parent study aims of detecting changes in SHSe from baseline to follow-up in a two-arm community RCT of 28 communities; this sample was also well powered to address the current research questions. The sampling strategies were different in the two countries because of availability of household data in Armenia (but not in Georgia) and the utility of ‘clusters’ (ie, geographically defined areas of 150 households) in Georgia (but not in Armenia). In both countries, we obtained census data for all households within the municipality limits from the Bureau of Statistics. In each household, the KISH method was used to identify target participants. Individuals ages 18–64 within selected households were eligible to be selected as participants. We approached study participants in-person at their homes, provided a study description, obtained written informed consent and administered the survey via electronic tablets.

In Armenia, addresses in each city were randomly ordered; assessments began at the beginning of the list and continued until the target recruitment in each city (n=50) was reached. Overall, 1128 households were visited, of which 27.4% (n=309) were ineligible (9.3% no household member ≥18 eligible, 10.6% closed door/not home/do not live there anymore, 6.6% non-existing address). Among the 819 eligible, 705 (86.1%) participated.

In Georgia, multistage cluster sampling was used to select study participants. In step 1, five clusters per city were identified. In step 2, 15 households per cluster were selected using a random walking method; the total number of households was divided by 15 (assuming ~75% response rate) to determine how many households needed to be skipped before arriving at the next designated household (eg, if the municipality included 150 households, the data collector would go from the first selected household to the 10th). Overall, 958 households were visited, of which 5.0% (n=48) were ineligible (no household member ≥18 reachable or eligible). Among the 910 eligible, 751 (82.5%) participated.

Measures
The following variables were included in the current analyses. The complete survey questionnaire is provided in online supplemental file 1.

Correlates of interest
We examined: (1) individual-level factors, specifically sociodemographics, tobacco use characteristics and tobacco-related risk perceptions; (2) interpersonal-level factors or social influences; and (3) community-level factors, specifically exposure to public smoke-free restrictions.

Individual-level factors: sociodemographics, tobacco use characteristics and risk perceptions. In terms of sociodemographics, current analyses included age, sex, education level, employment status, marital status and children under the age of 18 in the home.

Regarding tobacco use characteristics, we asked all participants about their lifetime cigarette use. We asked: ‘Have you smoked at least 100 cigarettes in your lifetime? 0=no; 1=yes’. Among lifetime cigarette users, we assessed past 30-day cigarette smoking: ‘0=everyday; 1=some days; 2=not at all’. Among past 30-day smokers (ie, current smokers, those reporting smoking on some days or everyday), we assessed number of days smoked, cigarettes smoked per day, readiness to quit (indicating readiness to quit in the next 30 days or in the next 6 months), past-year quit attempts (reporting any vs no quit attempt in the past year) and importance and confidence in quitting (0=not at all to 10=extremely important or extremely confident).

Risk perceptions were assessed using multiple measures. Participants were asked, ‘How harmful to your health do you think the use of cigarettes is, on a scale of 1=not at all harmful
to 7=extremely harmful? Participants were also asked, ‘Do you think or know that smoking is the cause of the following diseases and conditions: stroke (brain haemorrhage); heart attack; cervical cancer; lung cancer; mouth cancer; addiction; Parkinson’s disease; bronchitis; tuberculosis; obesity or none of these. We also asked, ‘Based on what you know or believe, to what extent does breathing other people’s smoke cause serious illness in non-smokers?’ and ‘To what extent do you think inhaling tobacco smoke when somebody else is smoking is harmful to you?’ with response options of: 0=not at all; 1=a little; 2=moderately; 3=extremely harmful. We also asked, ‘To what extent do you agree with this statement: after someone smokes in a room, dangerous particles are left behind in the dust, air and surfaces in the room: strongly disagree; somewhat disagree; somewhat agree or strongly agree.’ For the purposes of creating a single index score across these three items, we averaged the score across the three items (Cronbach’s alpha=0.86). Additionally, we asked participants, ‘Do you think or know that exposure to secondhand smoke is the cause of the following diseases: lung cancer in non-smokers; heart attack in non-smokers; asthma in children; middle ear infection in children or none of these’.

**Interpersonal factors: social influences.** Participants were asked, ‘How many of your closest friends (who might include relatives and coworkers) smoke cigarettes? 0=none; 1=almost none; 2=less than half; 3=about half; 4=more than half; 5=almost all; 6=all’. This item was operationalised as a continuous variable for analysis (range: 0–6). We also asked current smokers, ‘What do people who are important to you, like your friends and family, think about you smoking cigarettes?’ and ‘What do you think the general public’s attitude is towards smoking cigarettes?’ with response options of: 0=all disapprove; 1=about half disapprove; 2=about half approve and half disapprove; 3=most approve; 4=all or nearly all approve’. These two items were operationalised as a friend/family/public attitude index score by calculating the average rating across items (range: 0–4) (Cronbach’s alpha=0.59).

**Community-level factors: exposure to public smoke-free restrictions.** To assess smoke-free restrictions at work, we first asked participants whether they worked outside of the home, and if so, whether their workplace included an indoor setting. Among those indicating that their workplace included an indoor setting, we asked, ‘Which of the following best describes the smoking rules in your home: 0=smoking is allowed in all indoor areas; smoking is allowed only in some indoor areas; smoking is not allowed in any indoor area or every (restaurant/bar) has its own rules’. Each of these items were converted to single three-level restrictions ‘dose’ variables (0=allowed/no rules, 1=partial restrictions each has its own rules, 2=complete restrictions). We then created a single three-level restriction for both restaurants and bars (Cronbach’s alpha=0.94).

**Outcome: SFH restrictions.** Participants were asked, ‘Which of the following statements best describes the smoking rules in your home: 0=smoking in your home is allowed, 1=smoking in your home is generally not allowed with certain exceptions, 2=smoking in your home is never allowed or 3=there are no rules about smoking in your home?’ We then created a three-level restrictions ‘dose’ variable (0=allowed/no rules, 1=partial restrictions, 2=complete restrictions).

To further characterise factors related to restrictions in private settings and SHSe, we included additional measures. To more fully assess restrictions in personal settings, participants were asked, ‘How much do the people you live with help to enforce the rules regarding smoking in the home? not at all; a little; somewhat; a lot or we do not have rules about smoking in the home’. To assess restrictions in cars, participants were asked, ‘Which statement best describes the rules about smoking in your household vehicles (cars or trucks)? allowed in all vehicles; sometimes allowed in some vehicles; never allowed in any vehicle; no rules about smoking in the vehicles; or don’t own a vehicle’. We created a three-level restrictions ‘dose’ variable (0=allowed/no rules, 1=partial restrictions, 2=complete restrictions).

We assessed SHSe by asking, ‘In the past 30 days, on how many days did you breathe the smoke from someone else’s smoking? When assessing smoking in the home and car, we asked, ‘In the past 30 days, on how many days did someone smoke in your home?’ and ‘In the past 30 days, on how many days did someone smoke in your car?’ Additionally, we asked, ‘Who are the primary sources of secondhand smoke you inhale? (Check up to three): spouse/partner/significant other; parents; siblings; children; extended family; friends; people at work; other’. Current smokers were also asked, ‘How much do you try to minimise the amount that non-smokers are exposed to your cigarette smoke? not at all; a little; somewhat; or a lot’.

**Data analysis.** We first conducted descriptive analyses to characterise participants. Then, we conducted bivariate analyses to examine differences in sociodemographics, smoking-related characteristics and our primary correlates of interest (ie, sociodemographics, tobacco use characteristics, risk perceptions, social influences, exposure to public smoke-free restrictions): (1) between Armenia and
We then built a multivariable binary logistic regression identifying correlates of no/partial SFH restrictions versus complete restrictions (referent group). The models included sociodemographics, smoking-related characteristics (as appropriate) and our correlates of interest. (Regression analysis was also conducted using multilevel modelling to account hierarchical structure of the data (ie, participants at the individual level nested in communities)33–35; all intraclass correlations ranged from 0 to 0.01, and findings were not significantly different. Thus, we chose to present the simpler models accounting for country.) All analyses were conducted in SPSS V.26, and alpha was set at 0.05.

**Patient**

Community members were not involved in setting the research question or the outcome measures, but they were intimately involved in design and implementation of the intervention of the ongoing parent study.

**RESULTS**

**Participant characteristics in relation to SFH status**

Across both countries, participants were on average 43.35 years old, 60.5% were women, 32.1% with a college education and 49.0% employed. Overall, 54.2% of Armenians reported having no SFH restrictions, 21.9% partial and 23.9% complete (table 1). In contrast, only 16.8% of Georgians reported having no SFH restrictions, 39.9% partial and 52.3% complete. In both countries, having fewer SFH restrictions was associated with having a lower education level (p <0.050) and smoking more cigarettes per day among smokers (p <0.050). In Georgia, having fewer SFH restrictions was also associated with being men (p=0.002), and less importance and confidence in quitting among smokers (p <0.001).

Bivariate analysis (table 2) showed that, among Armenians, correlates of having fewer SFH restrictions included: reporting less frequently that smoking is associated with heart attack (p=0.006), cervical cancer (p=0.001) and tuberculosis (p=0.005); less belief that inhaling tobacco smoke is harmful (p=0.019); and reporting less frequently that SHSe is associated with lung cancer in non-smokers (p=0.048) and middle ear infection in children (p=0.006). Among Georgians, correlates of having fewer SFH restrictions included: lower perceived harm of smoking to smoker’s health (p<0.001); reporting less frequently that smoking is associated with stroke (p<0.001), heart attack (p<0.001), cervical cancer (p=0.041), lung cancer (p<0.001), addiction (p<0.001) and bronchitis (p=0.005); lower perceived risk of SHSe and THSe (p<0.001); and reporting less frequently that SHSe is associated with lung cancer and heart attack in non-smokers or asthma in children (p<0.001).

Regarding social influences, in both countries, having fewer SFH restrictions was associated with having more friends who smoked (p<0.001). In Georgia, having fewer SFH restrictions was also associated with smokers perceiving more approval of their smoking (p<0.001). In terms of exposure to public smoke-free restrictions, in Georgia, having fewer SFH restrictions also was associated with having fewer workplace smoke-free restrictions (p<0.001).

Bivariate analyses (table 3) indicated that correlates of fewer SFH restrictions in both countries included: less support from household members in enforcing rules (p<0.001); fewer household vehicle smoke-free restrictions (p<0.001); increased SHSe (p<0.001); more days where smoking occurred in the home and in the car in the past 30 days (p<0.001); having as primary sources of SHSe include one’s spouse/partner/significant other and friends (p<0.050); and fewer efforts to minimise SHSe among smokers (p=0.001). In Armenia, having fewer SFH restrictions also was associated with having as primary sources of SHSe include one’s siblings (p=0.015) and extended family (p=0.020). In Georgia, having fewer restrictions also was associated with having as primary sources of SHSe include one’s children (p=0.018) and others (p<0.001).

**Multivariable regression results**

Binary logistic regression analyses (table 4) indicated that, among non-smokers in Armenia, having no/partial SFHs correlated with being men (OR=0.38, p<0.001) and having more friend smokers (OR=1.23, p=0.002). Among smokers in Armenia, having no/partial SFHs correlated with being unmarried (OR=0.10, p=0.001), lower quitting importance (OR=0.82, p=0.010) and less favourable smoking attitudes among friends/family/public (OR=0.48, p=0.034).

In Georgia, among non-smokers, having no/partial SFHs correlated with older age (OR=1.04, p=0.002), being men (OR=0.18, p<0.001), lower SHS risk perception (OR=0.43, p<0.001), more friend smokers (OR=1.49, p=0.002) and fewer workplace (indoor) restrictions (OR=0.51, p=0.026). Among smokers, having no/partial SFHs correlated with being men (OR=0.02, p<0.001), not having children in the home (OR=0.17, p<0.001), daily smoking (OR=4.30, p=0.050), lower quitting confidence (OR=0.81, p=0.004), more friend smokers (OR=1.62, p=0.038) and fewer community restrictions (OR=0.68, p=0.026).

**DISCUSSION**

Data from this sample of Armenian and Georgian adults in 28 communities in a community RCT indicated alarmingly high national estimates of smoking prevalence.12 13 Historically, former Soviet Union countries including Armenia and Georgia have had among the highest tobacco use prevalence in the world among men, although relatively low among women.36 In countries with such high prevalence, SHSe in private settings such as homes and cars is particularly concerning, as those are the places where most SHSe occurs.37 Over half of the respondents (54.2%) from Armenia reported having no
| Variable                      | Armenia |                                           | Georgia |                                           |
|-------------------------------|---------|--------------------------------------------|---------|--------------------------------------------|
|                               | N=703 (100%) | N=381 (54.2%) | N=154 (21.9%) | N=168 (23.9%) | P value | N=751 (100%) | N=126 (16.8%) | N=232 (30.9%) | N=393 (52.3%) | P value |
| Sociodemographics             |         |                                           |         |                                           |
| Age, M (SD)                   | 42.58 (13.39) | 43.10 (13.43) | 41.02 (13.26) | 42.83 (13.41) | 0.261   | 44.08 (13.53) | 46.37 (14.06) | 43.72 (13.13) | 43.56 (13.55) | 0.113   |
| Sex, N (%)                    | 0.788   |                                           |         |                                           |
| Male                          | 208 (29.6)   | 110 (28.9)    | 49 (31.8)     | 49 (29.2)     |         | 365 (48.6)    | 65 (51.6)     | 132 (56.9)    | 168 (42.7)   | 0.002   |
| Female                        | 495 (70.4)   | 271 (71.1)    | 105 (68.2)    | 119 (70.8)    |         | 386 (51.4)    | 61 (48.4)     | 100 (43.1)    | 225 (57.3)   |         |
| Education, N (%)              | 0.021   |                                           |         |                                           |
| <High school                  | 161 (22.9)   | 87 (22.8)     | 32 (20.8)     | 42 (25.0)     | 62 (8.3) | 24 (19.0)     | 14 (6.0)      | 24 (6.1)      | 62 (8.3)     | 24 (6.1) |
| High school to some college   | 317 (45.1)   | 187 (49.1)    | 71 (46.1)     | 59 (35.1)     | 447 (59.5) | 75 (59.5)     | 149 (64.2)    | 223 (56.7)    | 447 (59.5)   | 75 (59.5) |
| ≥College degree               | 225 (32.0)   | 107 (28.1)    | 51 (33.1)     | 67 (39.9)     | 242 (32.2) | 27 (21.4)     | 69 (29.7)     | 146 (37.2)    | 242 (32.2)   | 27 (21.4) |
| Employed, N (%)               | 0.521   |                                           |         |                                           |
| Married/cohabitating, N (%)   | 533 (75.8)   | 286 (75.1)    | 122 (79.2)    | 125 (74.4)    | 527 (70.2) | 72 (57.1)     | 176 (75.9)    | 279 (71.0)    | 527 (70.2)   | 72 (57.1) |
| Children under 18 in the home, N (%) | 385 (56.6)   | 204 (55.6)    | 85 (56.6)     | 96 (57.1)     | 345 (45.9) | 35 (27.8)     | 118 (50.9)    | 192 (48.9)    | 345 (45.9)   | 35 (27.8) |
| Tobacco use characteristics   |         |                                           |         |                                           |
| Current smoking status, N (%) | 0.102   |                                           |         |                                           |
| Non-smokers                   | 560 (79.7)   | 294 (77.2)    | 123 (79.9)    | 143 (85.1)    | 497 (66.2) | 54 (42.9)     | 127 (54.7)    | 316 (80.4)    | 497 (66.2)   | 54 (42.9) |
| Current smokers               | 143 (20.3)   | 87 (22.8)     | 31 (20.1)     | 25 (14.9)     | 254 (33.8) | 72 (57.1)     | 105 (45.3)    | 77 (19.6)     | 254 (33.8)   | 72 (57.1) |
| Current smoking frequency, N (%) | 0.162   |                                           |         |                                           |
| Every day                     | 129 (90.2)   | 80 (62.0)     | 29 (93.5)     | 20 (80.0)     | 221 (87.0) | 67 (93.1)     | 89 (84.8)     | 65 (84.4)     | 221 (87.0)   | 67 (93.1) |
| Some days                     | 14 (9.8)     | 7 (8.0)       | 2 (6.5)       | 5 (20.0)      | 33 (13.0)  | 5 (6.9)       | 16 (15.2)     | 12 (15.6)     | 33 (13.0)    | 5 (6.9)   |
| Cigarettes smoked/day, M (SD) | 21.57 (11.23) | 23.76 (10.37) | 18.13 (12.66) | 18.10 (10.44) | 0.017    | 21.02 (10.62) | 25.23 (10.80) | 19.73 (9.66)  | 18.78 (10.72) | 21.02 (10.62) |
| Importance of quitting, M (SD) | 6.50 (3.69) | 5.89 (3.86) | 7.38 (3.10) | 7.55 (3.50) | 0.054   | 5.33 (2.86) | 4.32 (3.10) | 5.25 (2.48) | 6.44 (2.75) |
| Confidence in quitting, M (SD) | 4.82 (3.88) | 4.41 (3.98) | 5.97 (3.49) | 4.68 (3.88) | 0.153   | 4.79 (2.73) | 3.75 (2.81) | 5.14 (2.77) | 5.34 (2.31) |
| Past-year quit attempt, N (%) | 0.42 (6.0)   | 21 (5.5)      | 12 (7.8)      | 9 (5.4)       | 0.565   | 31 (4.1)     | 6 (4.8)      | 10 (4.3)      | 15 (3.8)     | 0.885   |
| Readiness to quit, next 6 months, N (%) | 0.20 (6.9)   | 11 (13.3)     | 8 (25.8)      | 4 (18.2)      | 0.278   | 25 (10.4)    | 4 (5.6)      | 12 (12.5)     | 9 (12.3)     | 0.277   |
SFH restrictions, thus leaving it as a prominent source of SHSe for the Armenian population. Considering 2016–2017 the national estimate of SHSe in the home in Armenia (56.4%), almost no progress has been made in this regard until recently in the country. In contrast, a smaller percentage of respondents (16.8%) from Georgia reported having no SFH restrictions. It is well documented that comprehensive tobacco control policies play an important role in shifting smoking behaviours and increasing the likelihood of introducing voluntary smoke-free restrictions in private settings such as homes, and these observed major differences in SFH restriction levels can be explained by the differences in tobacco control measures across the two countries. Comprehensive tobacco control policies have been implemented in Georgia earlier (2017–2018) and were already enforced at the time of the survey. In contrast, Armenia adopted such tobacco control policies only recently (2020), and comprehensive indoor smoke-free policies are to be in full effect in 2022. These differences in tobacco control measures across countries may also explain the findings that, in Georgia, no or partial SFH restrictions were also associated with fewer SFH restrictions in indoor workplaces and community. Studies conducted worldwide suggested that although smoke-free laws aimed to limit the SHSe in the indoor public places including workplaces (one of the main sources of SHSe in Armenia and Georgia), many studies showed an association between those laws and voluntary introduction of SFH restrictions. It is suggested that smoke-free laws in public settings and workplaces are one of the most effective ways to make people more aware of the dangers of SHS and stimulate adoption of SFHs. Additionally, people tend to eventually increase their support towards implemented smoke-free laws and, as a result, the likelihood of adoption such policies in their homes. Given that private homes are the main source of SHSe in both Armenia and Georgia, our study once again underscored the importance of such policies and their potential in changing smoking norms and behaviour such as implementing SFHs.

Both in Armenia and Georgia, one of the correlates of having no or partial SFHs was being men. This finding is in line with the current literature and can be explained by various facts. Prior research indicated that, in general, women are more supportive of smoke-free restrictions compared with men. Women also play the most important role in initiating SFH restrictions. Additionally, both in Armenia and Georgia, there is a substantial gender disparity regarding men (51.5% and 57.0%) and women (1.8% and 7.0%) smoking prevalence. Hence, many households in Armenia and Georgia continue to allow smoking in the home, which may be because smokers are less likely to introduce SFH restrictions and change smoking behaviour of others in their homes. The study showed that those respondents who were older,

| Variable | Armenia | Georgia |
|----------|---------|---------|
| Smoke-free home restrictions | | |
| None | 126 (18.0%) | 128 (16.8%) |
| Partial | 154 (21.9%) | 126 (16.8%) |
| Complete | 319 (45.1%) | 317 (40.7%) |
| Total | 703 (100%) | 751 (100%) |

P-value is from omnibus tests by country. *Among current smokers only. †On a scale of 0=not at all to 10=extremely. M, mean; N, number.

Table 1 Continued
Table 2  Bivariate analyses examining tobacco-related risk perceptions, social influences and exposure to public smoke-free restrictions in relation to smoke-free home restriction levels among Armenian and Georgian adults (2018)

| Variable                                              | Armenia |                                                                 | Georgia |                                                                 |
|-------------------------------------------------------|---------|-----------------------------------------------------------------|---------|-----------------------------------------------------------------|
|                                                       | Total   | Smoke-free home restrictions                                    | Total   | Smoke-free home restrictions                                    |
|                                                       | N=703   | None                Partial          Complete                  | N=751   | None                Partial          Complete                  |
|                                                       | (100%)  | (54.2%)             (21.9%)         (23.9%)                 | (100%)  | (16.8%)             (30.9%)         (52.3%)                 |
| Harm of Smoking to Smoker's Health, M (SD)             | 5.74 (2.18) | 5.71 (2.16) | 5.89 (2.07) | 5.70 (2.32) | 6.09 (1.71) | 5.20 (1.91) | 5.87 (1.85) | 6.51 (1.40) | <0.001 |
| Associated with smoking, N (%)                        | 498 (71.6) | 271 (72.1) | 103 (66.9) | 124 (74.7) | 404 (53.8) | 41 (32.5) | 124 (53.4) | 239 (60.8) | <0.001 |
| Stroke (brain haemorrhage)                            | 517 (74.3) | 284 (75.5) | 100 (64.9) | 133 (80.1) | 533 (71.0) | 68 (54.0) | 162 (69.8) | 303 (77.1) | <0.001 |
| Heart attack                                           | 268 (38.5) | 128 (34.0) | 55 (35.7) | 85 (51.2) | 154 (20.5) | 16 (12.7) | 47 (20.3) | 91 (23.2) | 0.041 |
| Cervical cancer                                        | 594 (85.3) | 320 (85.1) | 127 (82.5) | 147 (88.6) | 631 (84.0) | 88 (69.8) | 194 (83.6) | 349 (88.8) | <0.001 |
| Lung cancer                                            | 417 (59.9) | 216 (57.4) | 93 (60.4) | 108 (65.1) | 267 (35.6) | 33 (26.2) | 87 (37.5) | 147 (37.4) | 0.055 |
| Mouth cancer                                           | 528 (75.9) | 277 (73.7) | 114 (74.0) | 137 (82.5) | 279 (37.2) | 33 (26.2) | 70 (30.2) | 176 (44.8) | <0.001 |
| Addiction                                              | 197 (28.3) | 109 (29.0) | 35 (22.7) | 53 (31.9) | 35 (4.7) | 3 (2.4) | 7 (3.0) | 25 (6.4) | 0.066 |
| Parkinson's disease                                    | 429 (61.6) | 227 (60.4) | 92 (59.7) | 110 (66.3) | 278 (37.0) | 44 (34.9) | 68 (29.3) | 166 (42.2) | 0.005 |
| Bronchitis                                             | 333 (47.8) | 175 (46.5) | 62 (40.3) | 96 (57.8) | 106 (14.1) | 18 (14.3) | 23 (9.9) | 65 (16.5) | 0.071 |
| Secondhand and Thirdhand Smoke Beliefs Score, M (SD)   | 2.49 (0.63) | 2.45 (0.65) | 2.48 (0.64) | 2.57 (0.57) | 2.34 (0.89) | 1.71 (1.11) | 2.22 (0.85) | 2.61 (0.70) | <0.001 |
| Breathing SHS cause non-smoker illness § b             | 2.51 (0.67) | 2.48 (0.68) | 2.52 (0.67) | 2.57 (0.65) | 2.56 (0.70) | 2.07 (0.97) | 2.47 (0.68) | 2.74 (0.52) | <0.001 |
| Inhaling tobacco smoke is harmful § c                  | 2.52 (0.71) | 2.49 (0.74) | 2.47 (0.75) | 2.66 (0.57) | 2.50 (0.74) | 1.92 (1.05) | 2.42 (0.67) | 2.72 (0.55) | <0.001 |
| Belief in THS § d                                      | 2.55 (0.75) | 2.49 (0.79) | 2.57 (0.77) | 2.66 (0.61) | 2.51 (0.75) | 2.04 (1.01) | 2.37 (0.77) | 2.72 (0.54) | <0.001 |

Associated with Secondhand Smoke Exposure, N (%)     

Continued
Table 2  Continued

| Variable                                                                 | Armenia               | Smoke-free home restrictions | Georgia               | Smoke-free home restrictions | P value |
|--------------------------------------------------------------------------|-----------------------|------------------------------|-----------------------|------------------------------|---------|
|                                                                            | Total (N=703)         | None (N=381) (54.2%)         | Partial (N=154) (21.9%) | Complete (N=168) (23.9%)    |         |
| Lung cancer in non-smokers                                               | 462 (66.4)            | 236 (62.8)                   | 104 (67.5)            | 122 (73.5)                   | 0.048   |
| Heart attack in non-smokers                                              | 370 (53.2)            | 194 (51.6)                   | 81 (52.6)             | 95 (57.2)                    | 0.474   |
| Asthma in children                                                       | 536 (77.0)            | 283 (75.3)                   | 122 (79.2)            | 131 (78.9)                   | 0.494   |
| Middle ear infection in children                                         | 254 (36.5)            | 131 (34.8)                   | 46 (29.9)             | 77 (46.4)                    | 0.006   |
| Tobacco-related social influences                                        |                       |                              |                       |                              |         |
| Number of friend smokers index, M (SD) †                                | 2.94 (1.40)           | 3.10 (1.34)                  | 3.07 (1.32)           | 2.47 (1.49)                  | <0.001  |
| Friend/family/public attitude index, M (SD) (smokers) ‡                  | 0.93 (0.83)           | 0.92 (0.87)                  | 0.81 (0.80)           | 1.14 (0.66)                  | 0.366   |
| Exposure to public smoke-free restrictions                               |                       |                              |                       |                              |         |
| Workplace (indoor) restrictions, N (%)                                   | 0.135                 |                              |                       |                              |         |
| Allowed/no restrictions                                                  | 82 (11.7)             | 54 (14.2)                    | 14 (9.1)              | 14 (8.3)                     |         |
| Partial restrictions                                                     | 41 (5.8)              | 24 (6.3)                     | 11 (7.1)              | 6 (3.6)                      |         |
| Complete restrictions                                                    | 159 (22.6)            | 80 (21.0)                    | 32 (20.8)             | 47 (28.0)                    |         |
| Unemployed/employed without indoor                                       | 421 (59.9)            | 223 (58.5)                   | 97 (63.0)             | 101 (60.1)                   |         |
| Work restrictions dose, M (SD)                                            | 0.51 (0.84)           | 0.48 (0.82)                  | 0.49 (0.82)           | 0.60 (0.90)                  | 0.325   |
| Restaurants in your community N (%)                                      | 0.447                 |                              |                       |                              |         |

Continued
### Table 2  Continued

| Variable | Armenia | Smoke-free home restrictions | Georgia | Smoke-free home restrictions | P value | P value |
|----------|---------|-------------------------------|---------|-------------------------------|---------|---------|
|          | Total   | None (54.2%)                  | Partial (21.9%) | Complete (23.9%) |         |         |
|          | N=703 (100%) | N=381 | N=154 | N=168 | N=751 (100%) | N=126 (16.8%) | N=232 (30.9%) | N=393 (52.3%) |         |         |
| Allowed/no restrictions/do not know | 277 (39.6) | 151 (39.6) | 58 (37.7) | 68 (41.2) | 114 (15.2) | 24 (19.0) | 34 (14.7) | 56 (14.2) |         |         |
| Partial restrictions/each has its own rules | 388 (55.4) | 216 (56.7) | 85 (55.2) | 87 (52.7) | 52 (6.9) | 15 (11.9) | 10 (4.3) | 27 (6.9) |         |         |
| Complete restrictions | 35 (5.0) | 14 (3.7) | 11 (7.1) | 10 (6.1) | 584 (77.9) | 87 (69.0) | 187 (81.0) | 310 (78.9) |         |         |
| Bars in your community, N (%) | 0.275 | 0.217 |         |         |         |         |         |         |         |         |
| Allowed/no restrictions/do not know | 341 (48.7) | 184 (48.3) | 81 (52.6) | 76 (46.1) | 147 (19.6) | 27 (21.4) | 46 (19.9) | 74 (18.8) |         |         |
| Partial restrictions/each has its own rules | 333 (47.6) | 187 (49.1) | 67 (43.5) | 79 (47.9) | 37 (4.9) | 11 (8.7) | 8 (3.5) | 18 (4.6) |         |         |
| Complete restrictions | 26 (3.7) | 10 (2.6) | 6 (3.9) | 10 (6.1) | 566 (75.5) | 88 (69.8) | 177 (76.6) | 301 (76.6) |         |         |
| Community restrictions dose, M (SD) | 1.20 (1.05) | 1.18 (1.02) | 1.21 (1.06) | 1.25 (1.10) | 3.19 (1.49) | 2.98 (1.60) | 3.23 (1.46) | 3.22 (1.46) | 0.802 | 0.250 |

Do not know was: a. n=49 (3.4%); b. n=63 (4.3%); c. n=51 (3.5%); d. n=84 (5.8%); and e. n=158 (10.9%). Do not know recoded as 0 to create SHS and THS Beliefs score. Other variables not equaling column totals due to missing data.

P-value is from omnibus tests by country.

*On a scale of 0=not at all to 7=extremely.
†On a scale of 0=none to 6=all.
‡On a scale of 0=all/nearly all disapprove to 4=all/nearly all approve; average across two items.
§On a scale of 0=not at all or strongly disagree to 3=a lot/extremely or strongly agree.

M, mean; N, number.
Table 3  Bivariate analyses examining secondhand smoke exposure in relation to smoke-free home restriction levels among Armenian and Georgian adults (2018)

| Variable                      | Armenia                                      | Georgia                                      |
|-------------------------------|----------------------------------------------|----------------------------------------------|
|                               | Total (N=703)                                | Total (N=751)                                |
|                               | None (54.2%)                                 | None (16.8%)                                 |
|                               | Partial (21.9%)                              | Partial (30.9%)                              |
|                               | Complete (23.9%)                             | Complete (52.3%)                             |
|                               | **P value**                                  | **P value**                                  |
| Smoke-free restrictions       |                                              |                                              |
| Household helps enforce rules | 63 (8.0)                                     | 33 (4.4)                                     |
| Not at all                    | 46 (12.1)                                    | 30 (23.8)                                    |
| A little                      | 5 (7.8)                                      | 5 (8.4)                                      |
| Somewhat                      | 12 (7.8)                                     | 2 (0.9)                                      |
| A lot                         | 5 (3.0)                                      | 1 (0.3)                                      |
| No rules                      | 12 (8.2)                                     | 12 (8.4)                                     |
| Household vehicle restrictions|                                              |                                              |
| Allowed/no restrictions       | 143 (37.5%)                                  | 125 (16.6)                                   |
| Partial restrictions          | 15 (9.7)                                     | 10 (6.0)                                     |
| Complete restrictions         | 43 (27.9)                                    | 15 (9.7)                                     |
| Do not own a vehicle          | 191 (50.1)                                   | 152 (20.2)                                   |
| Secondhand smoke exposure (SHSe) |                                   |                                              |
| Any SHSe, past 30 days        | 529 (79.5)                                   | 475 (68.9)                                   |
| Number of days, past 30 days  | 303 (83.2)                                   | 113 (95.8)                                   |
| SHSe                          | 15.09 (12.70)                                | 8.77 (10.92)                                 |
| Smoking occurred in home      | 15.99 (12.38)                                | 21.35 (10.46)                                |
| Smoking occurred in car       | 11.29 (13.25)                                | 18.02 (12.56)                                |
| Primary sources of SHSe, N (%)|                                              |                                              |
| Spouse/partner/significant other | 127 (33.3)                                   | 92 (12.3)                                    |
| Parents                       | 52 (7.4)                                     | 26 (20.6)                                    |
| Siblings                      | 40 (10.5)                                    | 47 (20.3)                                    |
| Children                      | 45 (11.8)                                    | 19 (4.8)                                     |
| Extended family               | 52 (12.3)                                    | 19 (18.5)                                    |
| Friends                       | 52 (12.3)                                    | 15 (14.8)                                    |
| People at work                | 21 (13.6)                                    | 18 (14.3)                                    |
| Other                         | 51 (13.4)                                    | 31 (13.4)                                    |
| Try to minimise SHSe (smokers)| 0.001                                        |                                              |
| Not at all                    | 15 (18.5)                                    | 20 (30.4)                                    |
| A little                      | 5 (7.9)                                      | 8 (8.7)                                      |
| Somewhat                      | 12 (7.8)                                     | 2 (2.8)                                      |
| A lot                         | 5 (3.0)                                      |                                              |
| No rules                      | 12 (8.2)                                     |                                              |
| Household vehicle restrictions|                                              |                                              |
| Allowed/no restrictions       | 143 (37.5%)                                  | 125 (16.6)                                   |
| Partial restrictions          | 15 (9.7)                                     | 10 (6.0)                                     |
| Complete restrictions         | 43 (27.9)                                    | 15 (9.7)                                     |
| Do not own a vehicle          | 191 (50.1)                                   | 152 (20.2)                                   |

Continued
unmarried or not cohabiting were more likely to have no or partial SFH restrictions. Additionally, those households having no children in the home were less likely to have SFH restrictions. Various studies conducted in different countries documented that such demographic characteristics have the potential of changing household smoking habits and introducing SFHs.43 Having children in the family is considered a strong motivator for households, especially for women, to implement SFHs.43 Even in cases when women are unable to achieve a complete SFH, they are likely to introduce some strategies to reduce possible SHSe.43

People’s increased knowledge and beliefs regarding SHS and THS harms are shown to be strong correlates of smoke-free bans in the home.23 27 28 Our findings add to the knowledge about the association between SHS and THS risk perceptions and SFH restrictions, indicating that with increasing knowledge about the dangers of SHS and related risk perceptions, the likelihood of adopting SFH restrictions increases particularly among non-smokers. The reason that this pattern was observed in Georgia only may be due to having more advanced smoke-free regulations in place in various public places at the time of the survey compared with Armenia, which may resulted in better awareness about the harms of SHS and THS in the homes. Because many national smoke-free policies do not include the broad range of private settings (eg, cars, homes), interventions targeting education about the harms of SHSe and THSe are a key strategy, which may lead to alteration of perceptions of risks and beliefs. A clinical trial demonstrated that such interventions focusing on the education of household members about the harms of SHSe had a great potential to reduce children’s SHSe in homes and promoting SFH restrictions in Armenia.44

Consistent with the literature, one of the correlates of having no or partial SFH restrictions was having more friends who smoke.45 46 It is more likely that those who are repeatedly exposed to smoking by their friends and community members are less likely to create SFH restrictions. In cultures where tobacco use is highly prevalent such as Armenia and Georgia, smoking behaviour is not yet denormalised and is considered socially acceptable. This in turn affects one’s motivation to create and maintain SFH restrictions. In contrast, our study revealed that less favourable attitudes towards smoking among friends, family members and the general public were associated with no or partial SFH restrictions in Armenian smokers. The reason for this unexpected finding may be the differences in perceptions and social norms towards smoking across Armenia and Georgia. The current study findings have important implications for research and practice. These findings are particularly important for understanding the home context and revealing some critical windows for possible targeted interventions for creating SFHs in LMICs. The study indicated that people in certain demographic groups such as unmarried or not cohabiting were more likely to have no or partial SFH restrictions. Additionally, those households having no children in the home were less likely to have SFH restrictions. Various studies conducted in different countries documented that such demographic characteristics have the potential of changing household smoking habits and introducing SFHs.43

| Variable | Armenia | | | Georgia | | |
| --- | --- | --- | --- | --- | --- | --- |
|Smoke-free home restrictions | Total | None | Partial | Complete | Total | None | Partial | Complete |
| N=703 (100%) | N=381 (54.2%) | N=154 (21.9%) | N=168 (23.9%) | N=751 (100%) | N=126 (16.8%) | N=232 (30.9%) | N=393 (52.3%) |
| A little | 13 (9.7) | 9 (11.1) | 4 (12.9) | 0 (0.0) | 28 (12.0) | 15 (12.1) | 8 (6.9) |
| Somewhat | 52 (38.8) | 36 (44.4) | 7 (22.6) | 9 (40.9) | 102 (43.8) | 26 (37.7) | 52 (33.3) |
| A lot | 53 (39.6) | 21 (25.9) | 19 (61.3) | 13 (59.1) | 72 (30.9) | 7 (10.1) | 24 (61.9) |

P-value is from omnibus tests by country.
*Do not equal column total due to ‘do not know’ or ‘prefer not to answer’ responses.
†Among current smokers only.
M, mean; N, number.

Table 3 Continued

| Variable | Armenia | | | Georgia | | |
| --- | --- | --- | --- | --- | --- | --- |
|Smoke-free home restrictions | Total | None | Partial | Complete | Total | None | Partial | Complete |
| N=703 (100%) | N=381 (54.2%) | N=154 (21.9%) | N=168 (23.9%) | N=751 (100%) | N=126 (16.8%) | N=232 (30.9%) | N=393 (52.3%) |
| A little | 13 (9.7) | 9 (11.1) | 4 (12.9) | 0 (0.0) | 28 (12.0) | 15 (12.1) | 8 (6.9) |
| Somewhat | 52 (38.8) | 36 (44.4) | 7 (22.6) | 9 (40.9) | 102 (43.8) | 26 (37.7) | 52 (33.3) |
| A lot | 53 (39.6) | 21 (25.9) | 19 (61.3) | 13 (59.1) | 72 (30.9) | 7 (10.1) | 24 (61.9) |

P-value is from omnibus tests by country.
*Do not equal column total due to ‘do not know’ or ‘prefer not to answer’ responses.
†Among current smokers only.
M, mean; N, number.
Table 4  Binary logistic regression analyses examining correlates of having no or partial household smoking restrictions compared with complete restrictions among nonsmokers and smokers in Armenia and Georgia (2018) (ref: complete restrictions)

| Variable | Armenia: outcome of no/partial smoke-free home restrictions | Georgia: outcome of no/partial smoke-free home restrictions |
|----------|------------------------------------------------------------|------------------------------------------------------------|
|          | Non-smokers  | Smokers  | Non-smokers  | Smokers  | Non-smokers  | Smokers  | Non-smokers  | Smokers  | Non-smokers  | Smokers  | Non-smokers  | Smokers  | Non-smokers  | Smokers  |
|          | OR  | CI     | P   | OR  | CI     | P   | OR  | CI     | P   | OR  | CI     | P   | OR  | CI     | P   |
| Sociodemographics | | | | | | | | | | | | | | | |
| Age | 1.01 | 1.00 to 1.03 | 0.148 | 1.04 | 1.00 to 1.08 | 0.075 | 1.04 | 1.01 to 1.07 | 0.002 | 0.99 | 0.96 to 1.03 | 0.714 |
| Female (ref: male) | 0.38 | 0.22 to 0.67 | 0.001 | 2.31 | 0.23 to 23.21 | 0.477 | 0.18 | 0.07 to 0.45 | <0.001 | 0.02 | 0.00 to 0.09 | <0.001 |
| Unemployed (ref: employed) | 1.53 | 0.87 to 2.69 | 0.137 | 1.90 | 0.65 to 5.56 | 0.243 | 1.57 | 0.57 to 4.31 | 0.382 | 1.54 | 0.63 to 3.78 | 0.344 |
| Married/cohabitating | 1.09 | 0.68 to 1.72 | 0.729 | 0.10 | 0.03 to 0.37 | 0.001 | 0.91 | 0.46 to 1.83 | 0.798 | 0.71 | 0.30 to 1.67 | 0.438 |
| Children in the home | 0.82 | 0.54 to 1.24 | 0.342 | 1.82 | 0.68 to 4.87 | 0.233 | 0.84 | 0.42 to 1.67 | 0.609 | 0.17 | 0.07 to 0.43 | <0.001 |
| Smoking characteristics | | | | | | | | | | | | | | | |
| Smoke every day (ref: some days) | – | – | – | 0.82 | 0.14 to 4.73 | 0.820 | – | – | – | 4.30 | 1.00 to 18.44 | 0.050 |
| Quitting importance | – | – | – | 0.82 | 0.71 to 0.95 | 0.010 | – | – | – | 0.89 | 0.77 to 1.03 | 0.125 |
| Quitting confidence | – | – | – | 1.00 | 0.88 to 1.13 | 0.943 | – | – | – | 0.81 | 0.71 to 0.94 | 0.004 |
| Tobacco-related risk perceptions | | | | | | | | | | | | | | | |
| Perceived harm to smoker's health | 1.01 | 0.93 to 1.10 | 0.882 | 0.89 | 0.71 to 1.13 | 0.332 | 0.88 | 0.74 to 1.05 | 0.153 | 0.85 | 0.66 to 1.10 | 0.219 |
| Secondhand and thirdhand smoke beliefs | 0.92 | 0.66 to 1.28 | 0.612 | 0.93 | 0.46 to 1.89 | 0.843 | 0.43 | 0.29 to 0.62 | <0.001 | 0.88 | 0.53 to 1.46 | 0.619 |
| Tobacco-related social influences | | | | | | | | | | | | | | | |
| Number of friends who smoke index | 1.23 | 1.08 to 1.40 | 0.002 | 1.22 | 0.82 to 1.83 | 0.322 | 1.49 | 1.15 to 1.92 | 0.002 | 1.62 | 1.03 to 2.57 | 0.038 |
| Friend/family/public attitude index | – | – | – | 0.48 | 0.24 to 0.95 | 0.034 | – | – | – | 0.99 | 0.56 to 1.78 | 0.508 |
| Exposure to public smoke-free restrictions (doses) | | | | | | | | | | | | | | | |
| Workplace (indoor) restrictions | 0.83 | 0.60 to 1.14 | 0.245 | 0.66 | 0.37 to 1.19 | 0.167 | 0.51 | 0.29 to 0.92 | 0.026 | 1.04 | 0.61 to 1.75 | 0.897 |
| Community restrictions | 1.05 | 0.88 to 1.25 | 0.594 | 0.70 | 0.45 to 1.08 | 0.105 | 1.16 | 0.94 to 1.44 | 0.173 | 0.68 | 0.49 to 0.96 | 0.026 |
| Nagelkerke R² | .062 | 0.343 | 0.232 | 0.496 | | | | | | | | | | | |

p, p value.
older adults, men, those unmarried or not cohabitating and not having children require better-targeted interventions. Women should be considered as change agents and be assisted with better interventions addressing strategies to improve their ability to discuss and negotiate SFH policies. Interventions should also include education component aiming to increase knowledge regarding SHS and THS exposures by emphasising their harmful impact on the health of children. Further enforcement of comprehensive smoke-free policies is needed to accelerate positive changes in community norms towards protected and smoke-free environments, particularly in private settings.

Limitations
This sample may not represent the general adult populations of these countries; however, the cities involved in this study account for about a third of each country’s populations, respectively, but do not include: (1) the two largest cities—Yerevan and Tbilisi, where the smoking prevalence may be lower among men but higher among women; or (2) more rural areas, where the smoking prevalence may be higher among men but lower among women.12 13 Additionally, the sampling/recruitment methods across countries differed by necessity and yielded different composition by sex and smoking status. Our results could also be biased due to several factors, such as unmeasured variables associated with differential participation. Finally, the cross-sectional nature and self-reported assessments limit the ability to make causal attributions or account for bias. Relatedly, there were seeming contradictory responses to some questions (eg, home smoke-free restrictions and family member help in enforcing rules) that are difficult to interpret. Thus, these results must be cautiously interpreted.

CONCLUSIONS
Current results provide estimates on SFH restrictions in 28 communities in Armenia and Georgia and documented that private settings, particularly private homes, are lacking restrictions and remain major sources of SHSe. The findings revealed important correlates of having no or partial SFH restrictions and some cross-country differences, including some demographic and smoking characteristics, people’s perceptions and beliefs about the harms of SHS and THS exposures as well as lack of enforced smoke-free restrictions in some public places. These findings are important for improving and targeting interventions to protect people from SHSe and to reduce harms of smoking in former Soviet Union countries with similar tobacco control histories. The current findings also highlight the importance of comprehensive smoke-free bans in changing household smoking behaviours.

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Competing interests
None declared.

Patient consent for publication
Not applicable.

Ethics approval
This study involves human participants and was approved by the Institutional Review Boards of Emory University (IRB00097093), the National Academy of Sciences of the Republic of Armenia (IRB00004079), the American University of Armenia (AUA-2017-013), and the National Center for Disease Control and Public Health of Georgia (IRB00002150) approved this study. Participants gave informed consent to participate in the study before taking part.

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Data availability statement
Data are available upon reasonable request. Limited data sets are available upon reasonable request.

Supplemental material
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