

▶ INTERNATIONAL PERSPECTIVES



Assessing Potential Public Health Concerns in Airbnb Venues in Four Canadian Cities

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Abstract Airbnb is the world’s leading platform for peer-to-peer (P2P) short-term housing rentals. There are more than 100,000 Airbnb venues across Canada. Legislative efforts to regulate the P2P housing marketplace have not broadly considered public health impacts including injury prevention, tobacco smoke exposure, and food safety. Using publicly available data, our study quantified the proportion of Airbnb venues in Vancouver, Toronto, Montreal, and Quebec City that report 1) having injury prevention amenities (smoke alarms, carbon monoxide detectors, fire extinguishers, and first aid kits); 2) allowing smoking; and 3) providing breakfast. Data were collected in May 2018 for 31,535 Airbnb venues in Vancouver ($n = 6,385$), Toronto ($n = 15,722$), Montreal ($n = 6,702$), and Quebec City ($n = 2,726$). Most venues reported having a smoke alarm (89%), approximately one half reported having a carbon monoxide detector (56%), and less than one half reported having a fire extinguisher (47%) or first aid kit (35%). A small proportion reported providing breakfast (13%) and fewer reported allowing smoking (4%). We found safety deficiencies in thousands of Airbnb venues in these four cities. Would-be guests might be exposed to secondhand or thirdhand smoke in some Airbnb rentals. This study identified thousands of venues that are serving food, which potentially presents challenges related to food safety. Government agencies should take into account public health concerns when regulating the P2P housing marketplace.

Introduction

The peer-to-peer (P2P) marketplace allows people to sell goods and services to others through connections facilitated by Web or smartphone application platforms. Airbnb has emerged as the global leader for P2P short-term property rentals (Jefferson-Jones, 2016). Short-term accommodations brokered through Airbnb typically are used as an alter-

native to a stay in a hotel or other traditional hospitality offerings. In Canada, it is estimated that there are more than 100,000 Airbnb listings generating \$500 million in revenue for approximately 70,000 hosts (Grynol, 2017). Guests can choose from a variety of housing types listed on Airbnb including 1) a shared room, where guests could stay in a space with other people (akin to a hostel); 2) a private

room, where guests would stay with a host or hosts in the same building or unit; or 3) an entire property, where guests would not share any spaces with the hosts.

Researchers have highlighted the impact Airbnb has had on housing costs and availability in several Canadian cities (Wachsmuth, Kerrigan, Chaney, & Shillolo, 2017). Some regions in Canada have created regulations with an effort to collect lost tax revenue that would have been collected had guests stayed in hotels (“Quebec reaches ‘landmark’ deal,” 2017). Quebec law requires Airbnb hosts to obtain a permit from Quebec Tourism and hosts are expected to abide by housing regulations such as zoning rules (Government of Quebec, 2020a). Other policy approaches at municipal levels, such as in Montreal (“City moves to restrict Airbnb,” 2018) and Toronto (City of Toronto, 2020), have been developed to combat the high concentrations of P2P listings in neighborhoods that impact housing access and affordability. Housing is widely acknowledged as a key social determinant of health.

The P2P short-term housing sector has raised other public health concerns, including guest exposure to tobacco smoke. One study examined whether smoking was allowed in Airbnb venues and found that it differed greatly across Canada, noting a relatively high proportion of smoking allowed in properties in Montreal (Kennedy, Douglas, Stehouwer, & Dawson, 2018). Other public health concerns in Airbnb venues include a lack of fire safety amenities such as smoke alarms, carbon monoxide detectors, and fire extinguishers, as well as amenities such as the availability of first aid kits to address injury. One study of 16 U.S. cities that included

more than 120,000 venues found that one fifth of Airbnbs did not have smoke alarms (20%), only approximately one half had carbon monoxide detectors (58%), and less than one half reported the presence of a first aid kit (36%) or a fire extinguisher (42%) (Kennedy, Jones, & Gielen, 2019).

Additionally, there are potential public health concerns from meals prepared by Airbnb hosts for their paying guests. As the name suggests, many Airbnb venues offer breakfast. The Airbnb Help Center reminds hosts that different countries, states, and cities have different licensing requirements and rules related to providing food for guests (Airbnb Help Center, 2020a). Hotels, bed and breakfasts, and other traditional hospitality settings in Canada require food safety handling training for businesses preparing foods, and health inspectors can visit their premises to ensure food preparation environments meet standards (Wood, 2019).

Our study assessed potential public health concerns in Airbnbs in four Canadian cities, examining specifically the prevalence of important amenities relevant to public health such as smoke alarms, carbon monoxide detectors, fire extinguishers, and first aid kits. Further, this study reports the percentage of venues that describe in their house rules if smoking is allowed. Finally, our study determined the percentage of venues that reported offering breakfast for their guests. Taken together, these findings can inform how regulations could support public health.

Methods

Sample

All data were used with permission from Inside Airbnb (n.d.), an independent website that compiles publicly available information from Airbnb listings reported by hosts. The data for this study were collected by Inside Airbnb during May 2018. Within this sample, venues that described themselves as bed and breakfasts were removed from the list because these properties were likely to be licensed already and subject to a range of public health regulations.

Variables of Interest

The following variables were used: city (Vancouver, Toronto, Montreal, or Quebec); room type (shared room, private room, or entire

home/apartment); breakfast served; and presence of the following venue amenities: smoke alarm, carbon monoxide detector, fire extinguisher, first aid kit, and if smoking is listed as allowed in the house rules.

Analysis

Proportions of the variables of interest were reported by room type and city. We analyzed the data using SPSS version 24. This study did not involve human subjects and therefore did not require review by an institutional review board.

Results

The sample included 31,535 venues with the following distribution across the four cities: Vancouver, $n = 6,385$; Toronto, $n = 15,722$; Montreal, $n = 6,702$; and Quebec, $n = 2,726$. Most Airbnb venues in the sample (65%, $n = 20,643$) were classified as entire homes or entire apartments, with approximately one third (33%, $n = 10,371$) classified as private rooms and only a few (<2%, $n = 521$) classified as shared rooms.

Table 1 shows the percentage for each amenity relevant to public health reported across the entire sample, as well as by city and room type. Our findings are discussed below, grouped by the public health areas of injury prevention, tobacco smoke, and food safety.

Injury Prevention

We reviewed three amenities that are relevant to fire safety: reported presence of smoke alarms, carbon monoxide detectors, and fire extinguishers. The reported presence of smoke alarms across the entire sample was 88.9% ($n = 28,019$). The city with the highest reported prevalence of smoke detectors was Quebec (92.6%, $n = 2,523$) and the lowest was Montreal (83.1%, $n = 5,571$). The reported presence of carbon monoxide detectors across the entire sample was 56.2% ($n = 17,723$). Carbon monoxide detectors were reported to be present in 74.2% of venues in Toronto ($n = 11,659$) and in approximately 29% of venues in the other three cities. Reported presence of fire extinguishers across the entire sample was 46.6% ($n = 14,701$), ranging from 54.4% ($n = 1,483$) in Quebec City to 40.1% ($n = 2,690$) in Montreal. A single variable related broadly to injury prevention was the reported presence of first aid kits. Across the entire sample, first

aid kits were reported to be present in 35.4% of Airbnbs ($n = 11,166$), ranging from 41.3% ($n = 1,125$) in Quebec City to 29.2% ($n = 1,959$) in Montreal.

Tobacco Smoke

Across the entire sample, 4.1% ($n = 1,287$) of hosts reported allowing smoking. Montreal had the highest percentage of venues that allowed smoking (7.1%, $n = 475$) and Vancouver had the lowest (2.7%, $n = 170$). In each city, a greater percentage of venues that allowed smoking were classified as private rooms or shared rooms. In Montreal, over 13% of private or shared rooms allowed smoking, which was the highest percentage across the sample.

Food Safety

Across the entire sample, 9.2% ($n = 2,899$) indicated that breakfast was served or included at the Airbnb venue. The inclusion of breakfast was higher for venues where hosts were more likely to be physically present (private rooms and shared rooms): 13.3% ($n = 1,376$) for private rooms and 16.5% ($n = 86$) for shared rooms. Toronto had the highest percentage of venues providing breakfast with 11.2% of the sample ($n = 1,759$), including 14.1% of private rooms ($n = 784$) and 21.7% ($n = 68$) of shared rooms.

Discussion

This study identified that more than 3,500 venues listed on Airbnb did not report having a smoke alarm. Hotels in British Columbia (British Columbia, Office of Housing and Construction Standards, 2010), Ontario (Ontario Fire Code, 2007), and Quebec (Government of Quebec, 2020b) are required by law to undergo inspections for compliance with building codes (International Finance Corporation, 2017) and fire regulations. Smoke alarms are one of the most important fire safety amenities and have been broadly demonstrated to save lives (Gilbert, Dawar, & Armour, 2006). Jurisdictions such as Portland, Oregon, require licensing for people who wish to become Airbnb hosts and the licensing application requires venues to list smoke alarm locations (The City of Portland, Oregon, 2020).

Carbon monoxide detectors were more common in Toronto Airbnbs compared with Airbnbs in the other three cities. Carbon monoxide detectors in most Ontario homes have been mandatory since April 2015 (Ontario

TABLE 1

Amenities Relevant to Public Health in Airbnb Venues by City and Room Type

City	Room Type	Amenity # (%)					
		Breakfast	Smoke Detector	Carbon Monoxide Detector	Fire Extinguisher	First Aid Kit	Smoking Allowed
Montreal	Entire home/apartment (n = 4,579)	119 (2.6)	3,950 (86.3)	1,548 (33.8)	1,975 (43.1)	1,275 (27.8)	188 (4.1)
	Private room (n = 2,086)	158 (7.6)	1,591 (76.3)	392 (18.8)	698 (33.5)	674 (32.3)	282 (13.5)
	Shared room (n = 37)	1 (2.7)	30 (81.1)	7 (18.9)	17 (45.9)	10 (27.0)	5 (13.5)
	Total (n = 6,702)	278 (4.1)	5,571 (83.1)	1,947 (29.1)	2,690 (40.1)	1,959 (29.2)	475 (7.1)
Quebec	Entire home/apartment (n = 1,830)	81 (4.4)	1,723 (94.2)	572 (31.3)	1,035 (56.6)	716 (39.1)	27 (1.5)
	Private room (n = 872)	145 (16.6)	778 (89.2)	213 (24.4)	440 (50.5)	403 (46.2)	39 (4.5)
	Shared room (n = 24)	4 (16.7)	22 (91.7)	5 (20.8)	8 (33.3)	6 (25.0)	2 (8.3)
	Total (n = 2,726)	230 (8.4)	2,523 (92.6)	790 (29.0)	1,483 (54.4)	1,125 (41.3)	68 (2.5)
Toronto	Entire home/apartment (n = 9,867)	907 (9.2)	9,153 (92.8)	7,526 (76.3)	4,613 (46.8)	3,463 (35.1)	245 (2.5)
	Private room (n = 5,541)	784 (14.1)	4,844 (87.4)	3,960 (71.5)	2,751 (49.6)	2,167 (39.1)	293 (5.3)
	Shared room (n = 314)	68 (21.7)	261 (83.1)	173 (55.1)	135 (43.0)	114 (36.3)	36 (11.5)
	Total (n = 15,722)	1,759 (11.2)	14,258 (90.7)	11,659 (74.2)	7,499 (47.7)	5,744 (36.5)	574 (3.7)
Vancouver	Entire home/apartment (n = 4,367)	330 (7.6)	3,990 (91.4)	2,433 (55.7)	2,115 (48.4)	1,507 (34.5)	67 (1.5)
	Private room (n = 1,872)	289 (15.4)	1,573 (84.0)	851 (45.5)	867 (46.3)	791 (42.3)	91 (4.9)
	Shared room (n = 146)	13 (8.9)	104 (71.2)	43 (29.5)	47 (32.2)	40 (27.4)	12 (8.2)
	Total (n = 6,385)	632 (9.9)	5,667 (88.8)	3,327 (52.1)	3,029 (47.4)	2,338 (36.6)	170 (2.7)
Total	Entire home/apartment (n = 20,643)	1,437 (7.0)	18,816 (91.1)	12,079 (58.5)	9,738 (47.2)	6,961 (33.7)	527 (2.6)
	Private room (n = 10,371)	1,376 (13.3)	8,786 (84.7)	5,416 (52.2)	4,756 (45.9)	4,035 (38.9)	705 (6.8)
	Shared room (n = 521)	86 (16.5)	417 (80.0)	228 (43.8)	207 (39.7)	170 (32.6)	55 (10.6)
	Total (N = 31,535)	2,899 (9.2)	28,019 (88.9)	17,723 (56.2)	14,701 (46.6)	11,166 (35.4)	1,287 (4.1)

Ministry of the Solicitor General, 2016); however, more than 25% of Toronto Airbnb venues did not report the presence of a carbon monoxide detector. The province of Quebec recommends carbon monoxide monitors in residential settings. The cities of Vancouver (City of Vancouver, 2017) and Montreal (Montreal Fire Department, n.d.) require carbon monoxide monitors only in new construction and under specific building conditions. In Vancouver, Montreal, and Quebec City, however, the majority of Airbnb venues did not have a carbon monoxide detector. There have been recent events in P2P rentals resulting in the death of guests caused by accidents, including carbon monoxide poisoning (Liber, 2015).

First aid kits can be very helpful to address minor injuries. Most venues, though, did not report having a first aid kit available to guests. In online discussion forums from Airbnb

hosts, some question if first aid kits are a potential problem, particularly if children use medications or consume antiseptics included in a first aid kit (Airbnb Community Center, 2020). Airbnb's guide for hosts suggests that a first aid kit be made available (Airbnb Help Center, 2020b) and has conducted first aid kit giveaways for hosts (Schaal, 2014).

Across the four cities, more than 1,300 properties (approximately 4% of venues) reported that smoking was allowed. A previous study in Canada identified a higher percentage of Airbnb venues that allowed smoking in Montreal compared with other Canadian cities. Our study found similar results, with Montreal having the highest percentage of venues that allowed smoking (7.1%, n = 475), a percentage roughly 3 times higher than Vancouver (2.7%, n = 170). Although the vast majority of Airbnb venues in the four cities do not allow smok-

ing, there remains a concern that hundreds of venues do allow smoking. In contrast, major hotel chains in Canada have been smoke-free for more than a decade.

It is important to note that Airbnb's Web interface does not specify if a venue is smoke-free, only what the house rules are related to smoking. Therefore, Airbnb guests could enter a home where hosts smoke some or all of the time. On the Airbnb website, there is no required disclosure for smoking activities in the venues. Further, there is no required disclosure of past smoking activity, which means that guests could be exposed to either second-hand or thirdhand smoke during their visit.

When considering food safety, of interest are the venues that report to provide breakfast for guests staying with hosts (i.e., private rooms and shared rooms). This study demonstrates that these rentals are more likely

to include breakfast. Improperly handling or inadequately cooking food poses a risk for the spread of foodborne illness. Across Canada, restaurant workers are required to have food safety handler certifications. For most Airbnb venues, the maximum number of guests that could be exposed to unsafe food would be far fewer than at most restaurants. Food-related illnesses, however, can be reduced with food safety training and inspections. If a person acquires a foodborne illness and seeks medical attention, public health officials in Canada attempt to track down the origin by identifying what and where the person ate in the days preceding the illness. These public health officials should always consider if someone ate a meal prepared at an Airbnb.

Limitations

The data examined in this study do not represent all Airbnb venues in Canada: our study sample included approximately 30% of Airbnb venues in the country to provide a comprehensive view of public health issues in Airbnbs in four populous cities. The data used in this study were collected by Inside Airbnb from jurisdictions where there is a concern that Airbnb activities are influencing housing availability and/or housing prices.

Some of the findings of this study are likely to change because, since the time these data were collected, Toronto passed a bylaw that will apply various regulations to P2P short-term housing (“City moves to restrict Airbnb,”

2018; City of Toronto, 2017). The likely effect of this bylaw will be to reduce the overall number of available rentals. In this new regulatory environment, Airbnb hosts in Toronto are required to obtain a license, register with the city, and pay the municipal accommodation tax. The bylaw, however, does not include provisions relevant to public health issues such as food safety, injury prevention, or exposure to tobacco smoke, nor does the bylaw apply to rentals in which the renter is renting out part of their principal residence.

Importance

Many Airbnb venues in Canada have conditions that could pose a health risk to guests, including lack of fire safety amenities and first aid kits. Some Airbnbs allow smoking, but the lack of transparency on the Airbnb website makes it difficult to identify which venues are smoke-free. Hundreds of Airbnbs offer guests breakfast, although these premises are not inspected for food preparation safety and Airbnb hosts are not required to be trained in food safety.

Conclusion

Some jurisdictions have enacted legislation to regulate P2P short-term rentals; however, most of these regulatory efforts do not consider public health concerns. In jurisdictions with regulations for hotels, there appear to be loopholes for P2P short-term rentals. In jurisdictions with regulations for residences, there appears to be a lack of enforcement. Food

safety issues appear to have received the least amount of attention by Airbnb.

Municipal licensing processes could require food safety handler training for Airbnb hosts and public health authorities could include Airbnb venues in their inspection schedules. Additionally, it is important to institute systems where food outbreak investigations include questions related to meals prepared in P2P settings. Licenses should be displayed in the property and in the online listings on Airbnb. Furthermore, Airbnbs should be incorporated into public health websites where inspection records are available to potential renters. Both online and traditional media are often used to post a restaurant’s inspection records and results, for example, but a physical inspection record or notice posted in the property is more influential for presenting information about the Airbnb (Henson et al., 2006).

Future research could examine what effect the bylaws that require licensing of Airbnbs have on public health amenities. Additional research could be done to identify what food practices take place in Airbnb’s kitchens in order to determine the likelihood and frequency of unsafe food practices. 🍷

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