UBC Social Ecological Economic Development Studies (SEEDS) Student Report

UBC Health Sciences Precinct Smoke-Free Zones

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Executive Summary

This report looks at smoking on the UBC Vancouver (UBC-V) campus, specifically in the Health Sciences Precinct (HSP). The challenges of smoking management and exposure to second-hand smoke at UBC-V are persistent and are in need of greater attention from the institution. Two different aspects of smoking were investigated: (1) activity within the smoking zones of the HSP, and (2) the attitudes of individuals who spend time in the HSP in terms of smoking behaviour and policy. After collecting data from a field study and a survey, an analysis of the results was conducted and recommendations were created regarding ways to reduce the pollution and exposure to smoke in the HSP at UBC-V. There are three recommendations that derive from this work. Firstly, we recommend an increase in public education regarding current smoking policies due to the lack of understanding and consistency in current smoking policies across campus. Secondly, a bottom-up method of enforcement through the modification of social norms should be investigated and implemented within the HSP. And finally, we recommend creating designated smoke zones in UBC-V's HSP as a compromise between the needs of smokers and non-smokers while acting as an initial step in decreasing cigarette waste and exposure to second-hand smoke.

Introduction

Smoking has numerous negative environmental and social consequences. Cigarette butts that are dropped on the ground take approximately 10 years to decompose, their decomposition has an effect on water quality and they are generally very toxic to ecosystems (Pascual et al., 2013). Additionally, research has shown that exposure to second-hand smoke is associated with an increased risk for developing any of a number of different diseases, such as tuberculosis (Dogar et al., 2015). Due to the various environmental and health effects of smoking as well as the current state of the University of British Columbia Vancouver (UBC-V) campus' smoking regulations, increased attention of smoking behaviour at UBC-V is essential.

There are several university campus hospitals that exemplify successful smoking reduction rates among its visitors and staff. In a case study done by Poder et al. (2012), six sites were observed at two different university hospitals in Sydney two weeks prior to the policy implementation and then at multiple time intervals post-implementation. The policy provided staff and patients with an eight week supply of nicotine-free replacement therapy, counseling services and online support and training for smoking cessation. Results showed a 36% reduction in observed smoking incidents on hospital grounds two years after the implementation of a smoke-free policy. This reduction was seen primarily in staff and visitors and not in patient smoking rates.

In another case study conducted at a hospital at Hacettepe University, participants were asked about the necessity of having smoke-free zones on site. Results showed that the majority of participants agreed that there is a need for smoke-free zones (Koç & Aslan, 2014). However, the results also showed low levels of participant awareness of the health risks associated with second-hand smoke. The discrepancy between the public's high interest in smoke-free zones and low awareness of the health risks of second-hand smoking may be indicative of the need for the

establishment of smoke-free zones in open public spaces (e.g. hospital gardens). Smoke-free zones may fulfill the public's need for these spaces on campus without the need to change smokers' perception of the health risks associated with second-hand smoking.

Song et al. (2015) conducted a longitudinal survey of youth, from 1997 to 2007, on smoking policies and its effects on smoking behaviour. After surveying more than 4000 individuals, they found significantly lower odds of initiating smoking with the implementation of smoke-free laws. Accordingly, smoke-free laws and policies are effective tobacco control tools as they protect people from second-hand smoke and seem to be effective in reducing the amount of smoking among adolescent and young adults.

Other local and regional universities have implemented certain policies pertaining to smoke-free zones. Research has found that the University of Victoria, Simon Fraser University and the University of British Columbia Okanagan (UBC-O) all have smoke-free zones campuses (Zhang, personal communication, 2017). Furthermore, the UBC-O campus uses gazebos as designated smoke zones in various locations around the campus. Koç & Aslan also acknowledge the increasing trend of more smoke-free outdoor spaces around gardens, hospitals and public institutions (2014).

Having smoke-free workplace policies, which refer to the rules that designate the workplace as a place that prohibits smoking, seem to be effective in the reduction of smoking. However, challenges in the management of smoking and second-hand smoke exposure at UBC-V are persistent and requires greater attention. UBC-V currently implements an 8-meter smoke-free rule that prohibits individuals from smoking 8-meters from any wall or opening to a building. However, the signage is not consistent in various spaces on campus nor do people frequently comply to the request of the signage. In addition, there are geographical factors that impede the creation of smoke-free workplace policies at UBC-V compared to other academic

and non-academic institutions such as the significantly larger surface area that the campus occupies. As well, having a hospital situated on a university campus further complicates the conditions of the study as the space is shared by multiple different stakeholders, including but not limited to students, staff, patients and faculty. However, these challenges should not dissuade the institution's attention and action regarding on campus smoking behaviour and policies as the creation of a smoke-free campus is an important step in creating a strong message for the health of those who occupy the space (Koç & Aslan, 2014).

This report addresses a challenge that was brought forth by the Faculty of Medicine. Accordingly, representatives from the Faculty of Medicine connected with the UBC SEEDS Sustainability Program (SEEDS) and a directed study opportunity for students was proposed. It was their hope to investigate the possibility of a smoke-free zone in the HSP through a collaborative effort with SEEDS and two undergraduate students. Two aspects of smoking on campus were decided to investigate as part of the directed studies: (1) activity within the smoking zones of the HSP, and (2) the attitudes of individuals who spend time within the HSP regarding smoke behaviour and policy. This topic was investigated through both a geopolitical lens and a psychological lens by two undergraduate students. The focus of this report will be the smoke zones through a psychological lens.

Methods

Survey. To understand the attitudes of the residents of the Health Sciences Precinct, a survey was designed and administered. With the assistance of the representatives of the Faculty of Medicine, the survey was distributed electronically to the staff working within the HSP. Additionally, various student groups on the UBC-V campus who are located within or in close proximity to the HSP were contacted and asked to participate in the survey, such as the Medical Undergraduate Society and Pharmacy Undergraduate Society. Lastly, students who spend time in the Life Science Building and Woodwards Building were individually asked to participate in the electronic survey. The survey (see Appendix A) consisted of a total of 13 questions administered through UBC's Fluidsurvey platform, which included a mixture of multiple-choice and open-ended questions. The survey contained questions regarding the participants' socio-demographic characteristics, their perceptions on smoking behaviour as well as their opinions on potential smoke-free policies within the HSP in the future.

Field Observation. The second method which was used to collect data was a field observation. Over a span of three days, the undergraduate researchers walked through the HSP while noting down observations regarding smoking behaviours and policies within the area, including the location of high density smoking areas, consistency of smoking signage and smoking infrastructure. Furthermore, smoking butts within various location in the HSP were counted to gain a better understanding of the location of smoking behaviour in the HSP. The locations with the cigarette butts were amalgamated and illustrated on a heat maps that visually displays areas of smoking behaviours within the HSP.

Ethical Approval. All research methods were approved by the UBC Behavioural Research Ethics Board, after an initial review by supervising professors.

Results

Result Summary. The data collected from the field observation and survey yielded various trends on smoking behaviours within the HSP at UBC-V. Smoking behaviours are observed primarily near the hospital lanes, streets and sidewalks and those who reside within the HSP are exposed to second-hand smoking at a moderate level. The majority of the participants support the HSP being be turned into a smoke-free zone in order to decease their exposure to second-hand smoking, align public behaviours with the health mandate of the HSP and to decrease smoking butt waste. It is perceived by members of the public who do not support the HSP becoming a smoke-free zone that smoking is already well regulated and that compliance to new smoking policies is doubtful. The participants in favor of designated smoke-zones suggested they be located in the patient park, just outside the HSP or far away from the HSP. Lastly, signage of smoke-free zones, additional infrastructure and the implementation of designated smoke-zones are suggested ways to discourage smoking and direct smokers to the appropriate smoking locations.

Survey Demographics. Figure 1 and 2 illustrate the demographics of the survey participants. The survey has a sample size of 179 survey participants, where the vast majority (95.3%) of survey participants were non-smokers (Figure 1). Furthermore, the majority of people surveyed within the HSP were staff and students, with percentages of 52% and 45%, respectively (Figure 2). The remaining 3% included 4 faculty members and one prospective student.

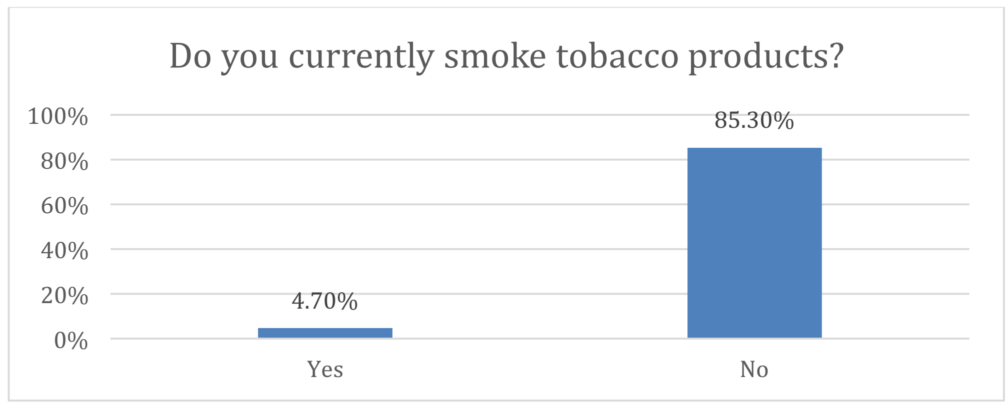

Figure 1: Percentage of survey participants who use tobacco products.

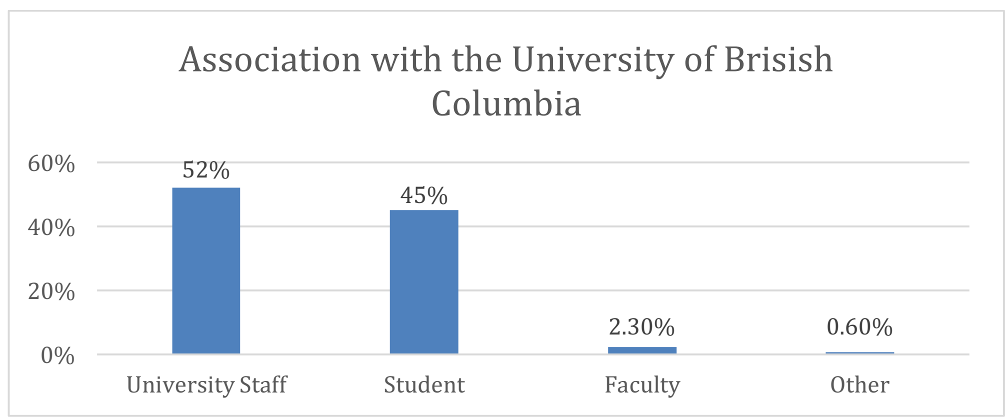

Figure 2: Distribution of survey participants in terms of their association with UBC-V.

Locations Where People Smoke. Figure 3 illustrates the locations in the HSP at UBC-V where participants observe individuals who smoke. Participants were provided with specific areas within the HSP and were asked to identify where they observe individuals who smoke. The locations that the survey participants identified most frequently are the sidewalks, walkways and hospital lanes. The majority of the smoke butts are found near buildings and in locations that are less visible to the public.

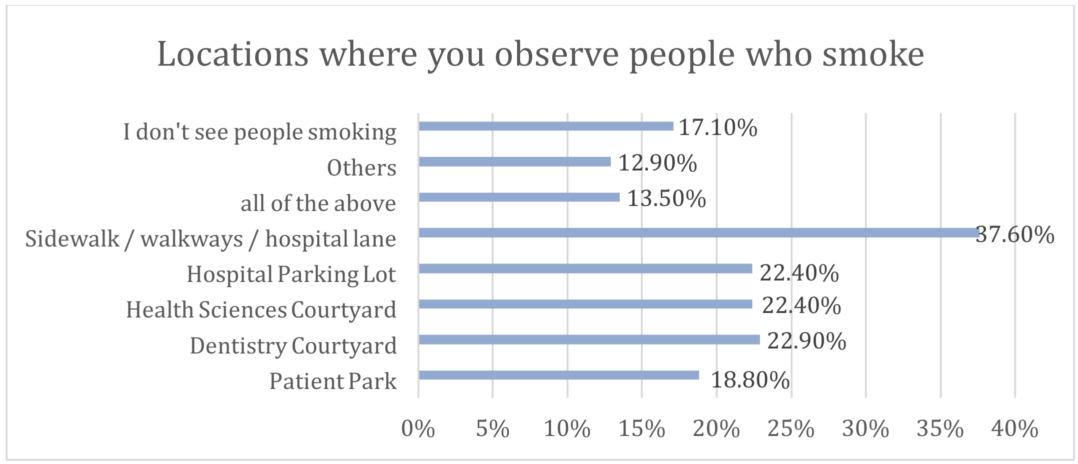

Figure 3: Locations where survey participants observe individuals who smoke within the HSP.

Exposure to Second-Hand Smoke. Figure 4 illustrates the degree to which survey participants were exposed to second-hand smoke in the HSP. 13.6% have never been exposed to second-hand smoking in the area and 43.2% were exposed to second-hand smoke in the HSP less than 3 times a month. On the higher end, 32.5% said they have been exposed to second-hand smoke 1-2 times per week and 10.7% said that they have been exposed 4-5 times per week. There is a slightly larger proportion of individuals who were not exposed to second-hand smoke as often.

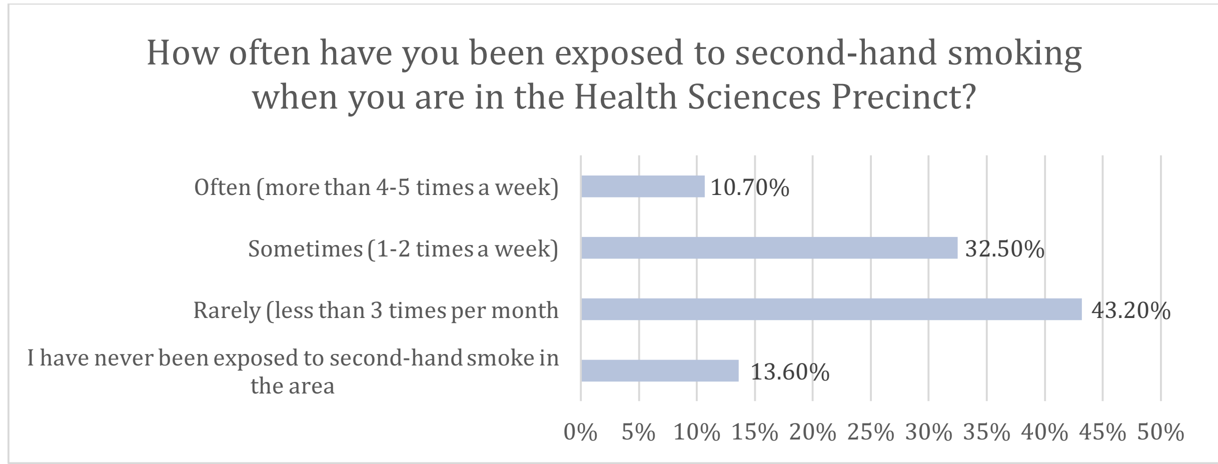

Figure 4: The exposure to second-hand smoke that survey participants experience within the HSP.

Smoking Policy Compliance. Figure 5 illustrates the degree to which survey participants reported witnessing people complying with the 8-meter-from-buildings smoking policy. Participants were asked whether they agree with the statement "I often encounter people who comply with the 8-meter smoking policy. Results show that 8.8% of the participants said they strongly agree, 32.2% agree, 4.6% disagree and 8.8% strongly disagreed with the statement. There seems to be a divide between the public's view of whether the policy is being complied with. There was a large percentage of the participants (44%) that responded as being neutral to the statement. This neutrality may suggest that people are not aware of the 8-meter rule or that it is not salient enough of an issue for them to form a clear opinion.

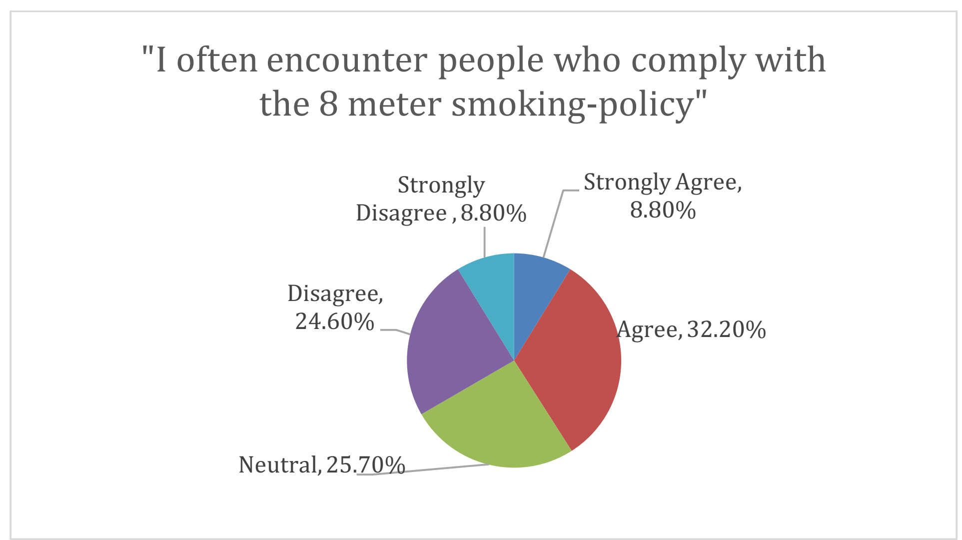

Figure 5: The distribtution of survey participants' perception on the public's compliance to smoking policies within the HSP.

The HSP as a Smoke-Free Zone. Figure 6 illustrates the proportion of participants having either positive or negative attitudes towards making the HSP at UBC-V a smoke-free zone. Participants were asked whether or not they would support the Health Sciences Precinct being made into a smoke-free zone. Approximately 61% of the participants said "definitely yes", 18.4% said "likely yes", 8.6% were neutral, 7.9% said "likely no" and 3.8% said definitely not. Similarly, the results of Koc and

Aslan's study showed 84.6% participants said it should be completely prohibited to smoke in outdoor spaces and 83.6% of participants said it would be a positive initiative for smoke-free areas (2014). Although the majority of participants support the creation of a smoke-free zone in the Health Sciences Precinct, this may not be representative of the public's attitudes as the majority of the survey participants do not smoke.

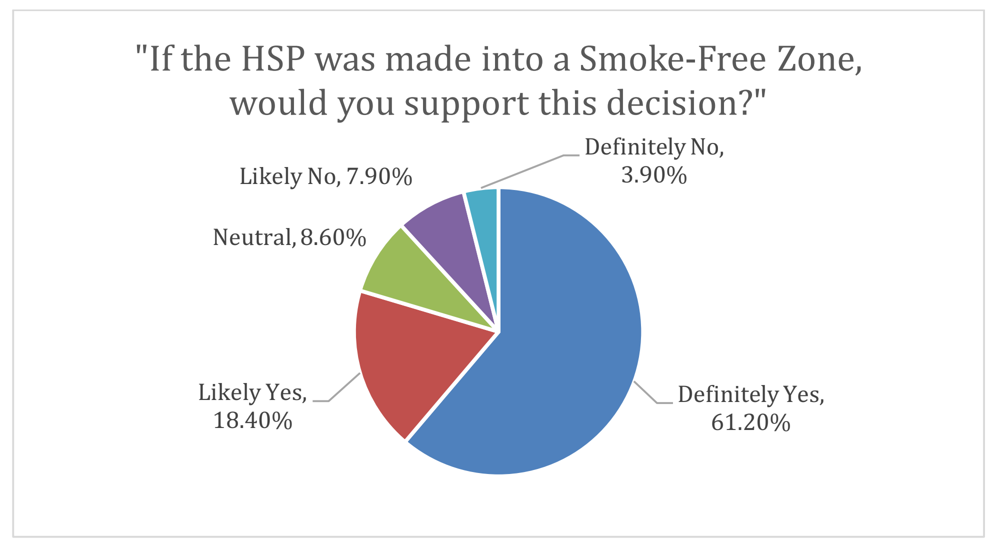

Figure 6: Distribution of survey participant's attitude for a smoke-free HSP.

Reasons to make HSP a Smoke-Free Zone. Figure 7 illustrates the reasons for participant's positive attitude of making the HSP at UBC-V entirely smoke-free. Participants who supported the HSP becoming a smoke-free zone were asked what was the most important reason for such attitude. The number one reason that people identify for having a smoke-free zone is to reduce the second-hand smoke exposure, with 90.5% of the participants agreeing to this. In addition, 56.8% of the participants said that a smoke-free HSP would align with the mandate and health-promoting purposes of the HSP. 42.6% said their reason was to decrease cigarette waste, 31.1% to minimize social impact of smoking and 27.7% to campus-wide sustainability initiatives.

There seems to be a tendency for the participants to identify reasons that affect their personal well-being directly rather than in more indirect forms such as

environmental health. This is important information to use when considering what topics to emphasize for educational tools, whereby topics regarding health may be more effective than environmental sustainability.

Referring to the participants' comments, there is a sentiment of concern for one's personal health when exposed to second-hand smoking. One participant said that there should be "compassion for people who might get cancer" from the exposure to second-hand smoke. This concern is reflected in the survey results as exposure to second-hand smoking is the reason most highly agreed upon for supporting the idea of a smoke-free HSP.

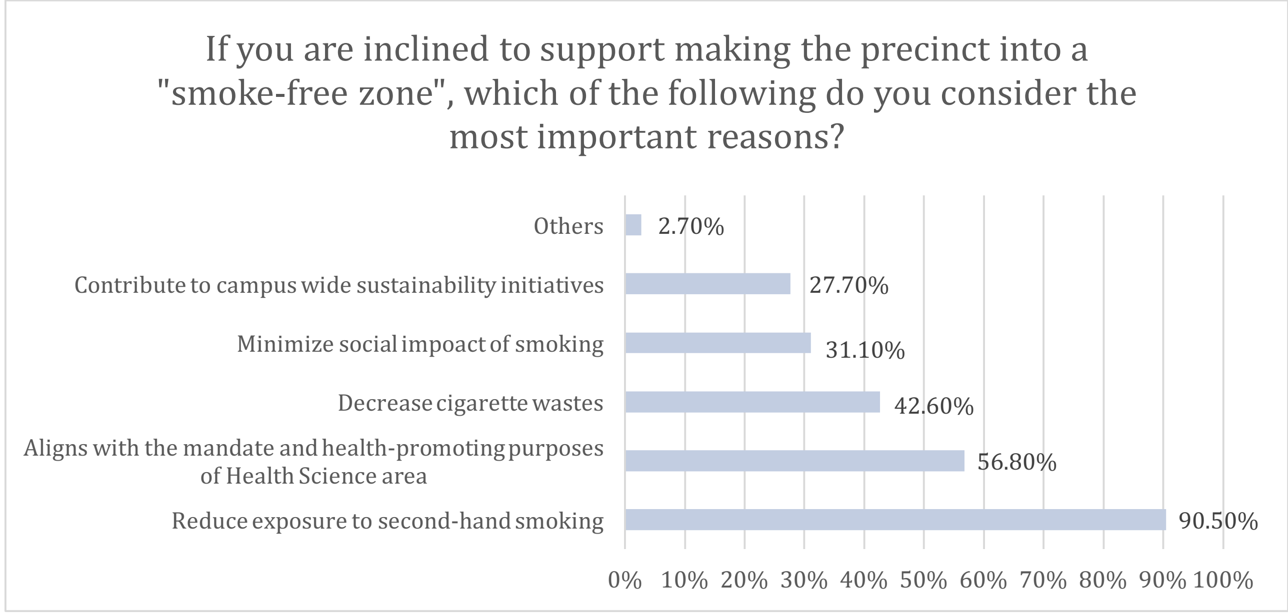

Figure 7: Reasons that survey participants are inclined to support a smoke-free HSP.

Reasons preventing a Smoke-Free HSP. Figure 8 illustrates the reasons for participant's negative attitude towards making the HSP at UBC-V entirely smoke-free. Participants who were against making the smoke-free HSP were asked to identify the reasons for their attitudes. The three primary reasons that participants responded against smoke-free zones are that 1) they are doubtful of the smokers' compliance to new smoke-free zone regulations and policies (50%), 2) the

perception that smoking behaviour is already well-regulated through current policies (36.5%) and 3) there are no ideal alternative locations for people to smoke (28.8%). The two remaining reasons include inconsideration of smokers' rights and the financially unfeasibility, with the percentages being 26.9 and 2.8 respectively. The results may suggest that there is a need for alternatives for smokers if a change in policy is implemented to support a shift in behaviour rather than a complete change from smoking to non-smoking. In the survey comment section, participants point that "smoking is an addiction and it's not an easy thing to quit" and that "many patients smoke as a stress or pain relieve". There are also concerns that having a smoke-free HSP would be an inconvenience as it requires smokers to search for another area to smoke. This seems to suggest a need for an allocated space for smokers to use as the hospital's patients have expressed a difficulty finding a place to smoke and that addicts should not be alienated from the health care system. One participant suggests having a designated smoke area with ashtrays for people to put their smoke butts rather than disposing them on the ground. This could help to reduce the cigarette pollution rates.

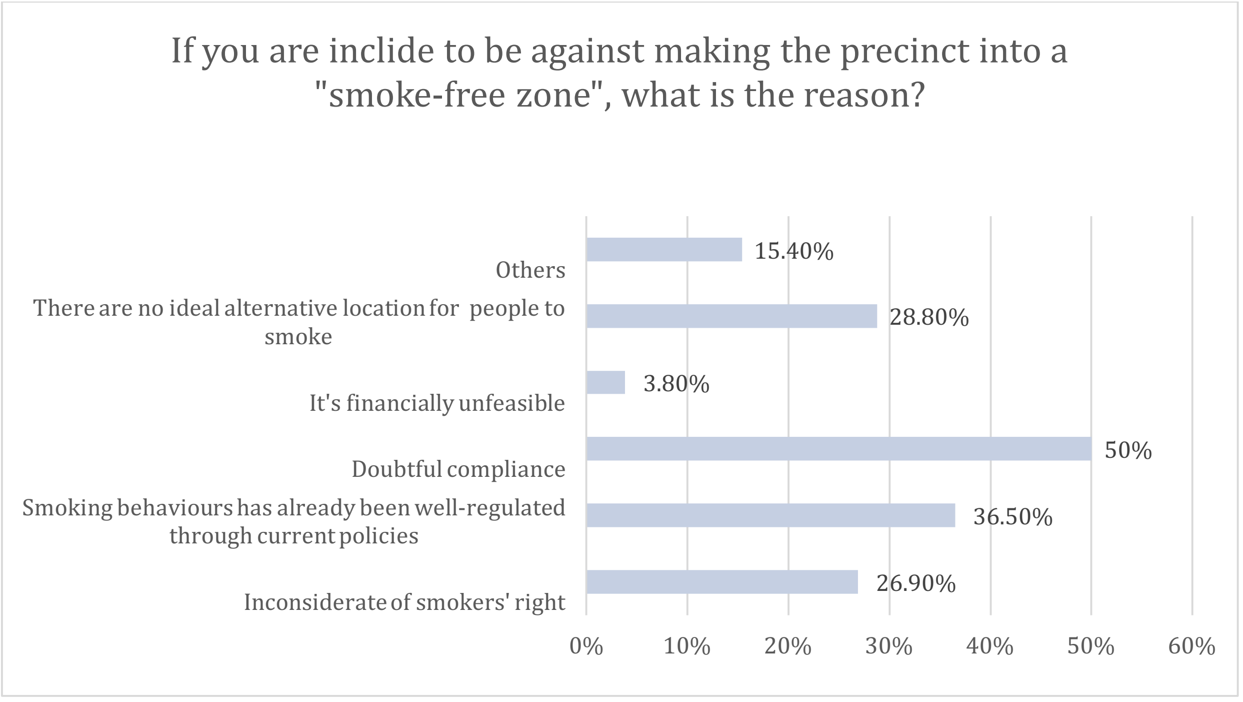

Figure 8: Reasons that survey participants are against a smoke-free HSP.

Designated Smoke Zones in HSP. Figure 9 illustrates survey participants' attitude on designated smoke zones within the HSP. Participants were asked whether having designated smoke zones within the HSP should be allowed. 60% of the participants said yes and 40% said no towards the statement "Do you think that there should be designated areas within the HSP where smoking tobacco products is allowed?". There is an approximately even split in people's attitudes towards designated smoke zones within the HSP.

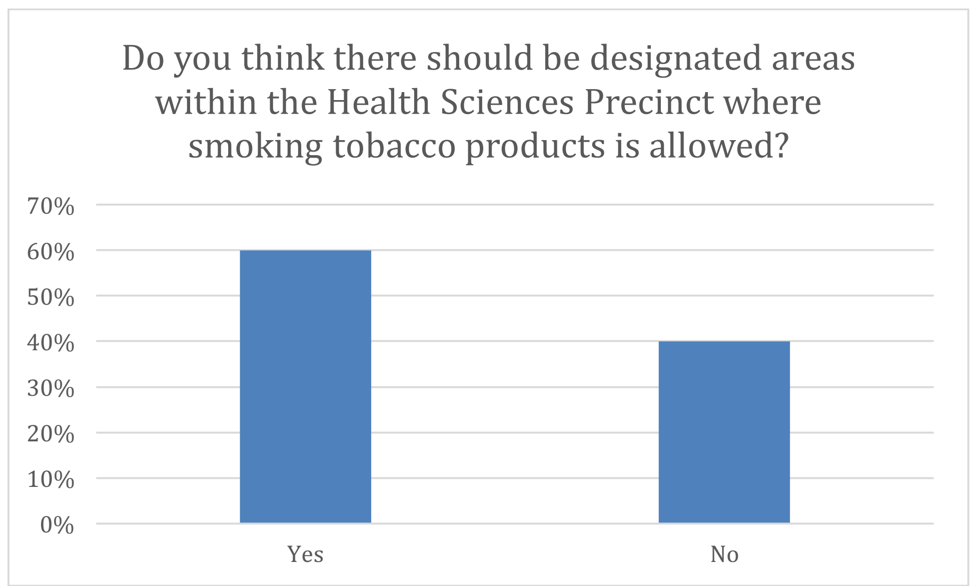

Figure 9: Survey participant's attitude for designated smoke areas within the HSP.

Figure 10 illustrates the ideal locations for designated smoke areas within the HSP at UBC-V from the perspective of the participants. The participants who are in favour of the creation of designated smoke zones suggested desirable locations both within and outside the HSP (Figure 10). The top three areas to locate the designated smoke zones were "inside the Patient Park where there are existing ashtrays" at 31%, Outside the Precinct nearby open spaces at 28.9% and Outside the Precinct far away at 25.4% (See Appendix B). The survey comments suggest that these areas should not be at an inconvenient distance for people within the precinct but not so close that people are still exposed to the second-hand smoke. There should be

multiple zones in the location where the smoke-free zones are designated and this must be communicated to the public.

Based on the survey comments, it is important to have smoke zones in sheltered or covered areas so there is a greater compliance to the smoking policies when there are unfavourable weather conditions. In addition, the designated smoke zones' convenience in terms of distance from the workplace is a key factor for its usage as well as the presence of ashtrays and smoking poles. Lastly, the impact that designated smoke zones have on other people must be considered, as some participant suggest that the smoke areas are "secluded and away from foot traffic".

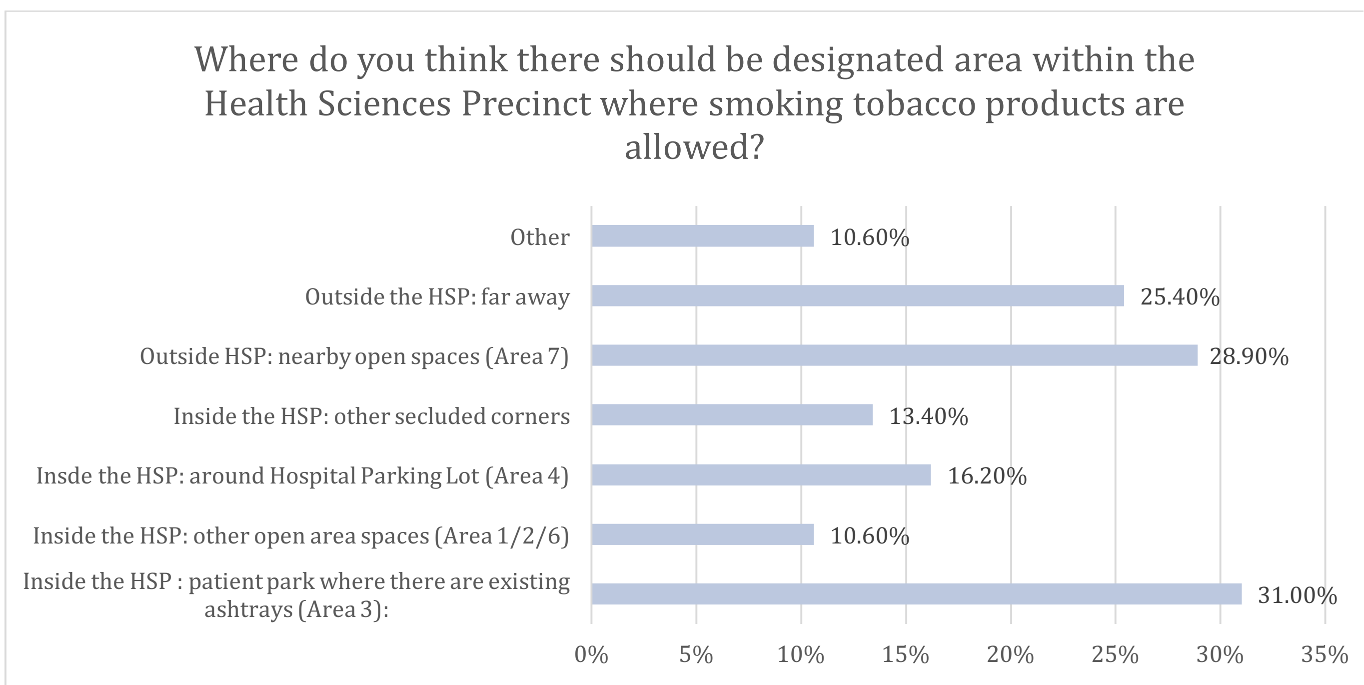

Figure 10: Locations to place designated smoke zones within the HSP.

Figure 11 illustrates methods that would help to manage smoking behaviours in the HSP at UBC-V. Participants were asked for their thoughts regarding the most effective ways to discourage smoking and to encourage smokers to use appropriate smoking locations. 63.1% of the participants were in favour of signage indicating smoke-free areas, 44.6% for ashtrays and smoker's poles and 33.8% for the

implementation of an enclosed designated smoke areas. Other methods include signage indicating harm of smoking and cigarette waste at 31.2%, posters and campaigns at 29.3%, educational programs at 26.8% and marked benches next to waste disposal unit at 24.2%.

The survey comments suggest that formal enforcement by campus security is needed by administering fines in order to better manage smoking behaviours. There are also a mix of feelings regarding the effectiveness of signage in changing public behaviour. The participants also note that educational programs and campaign may not reach the attention of hospital visitors of the hospitals. Lastly, a participant emphasizes the importance of being consistent with the messages that comes with the implementation of the policies as it is “counterproductive and even a double-standard to provide designated smoking areas and/or to have ashtrays, smoker's poles etc. It is important not to have inconsistent messaging when it comes to public health”.

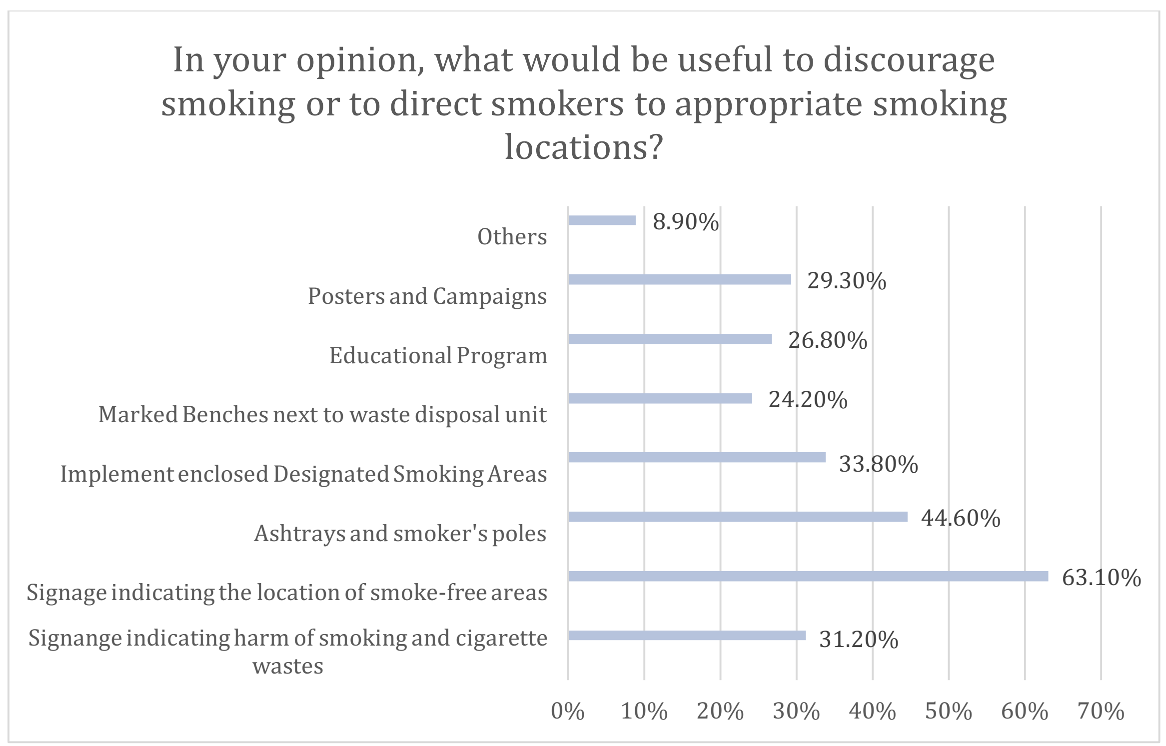

Figure 11: Methods to discourage smoking and direct smokers to appropriate smoking location.

Heat Map Results. Figure 12 (See Appendix B) illustrates the locations of smoking behaviours and the frequency of such behaviour within the HSP at UBC-V. The heat map was created to visually display areas of high smoking rates within the HSP. Site visits throughout the summer of 2016 were conducted to count the number of smoke butts that laid on the ground. This was created to give a general overview of locations where individuals smoke within the HSP. The site visits and butt counts are recommended to continue over time to retrieve data points over a longer period as this may be used as a baseline for future studies as well as to help strategize policy planning. Based on the results of survey figure 3, the high smoking rates appear in the sidewalks, walkways and hospital lanes which is also supported by the high smoke butt counts in these same locations.

Recommendations

Based on the survey results, the literature and the geographical and social context of UBC's hospital, recommendations were developed on how to approach the challenge of smoking around the HSP at UBC-V. Three recommendations are suggested and expanded upon; (1) increased public education regarding current smoking policies, (2) enforcement from the bottom up through modification of social norms and (3) the creation of designated smoke zones on campus. The World Health Organization's International's International Agency for Research on Cancer mirrors the first two suggestions, noting that public education and enforcement efforts are necessary when smoke-free policies are implemented. The need for enforcement efforts usually decreases after the policy is established, as it typically becomes self-enforcing (IARC, 2009). Similarly, Nykiforuk et al. says that enforcement should take on an awareness and educational component, particularly in workplaces (2010).

Recommendation 1: Educating the Public

Increasing the amount of education on the current UBC smoking policies and the negative health consequences of second-hand smoking is recommended. Galloway (1988) explains how "communicating the policy to the public is extremely important when the facility is a public place" (p. 57). Forms of education may include but are not limited to more signage, identified locations of where to smoke, positive signs and available resources for smokers. However, the survey only shows 29.3% of the participants interested in posters and campaigns as the medium to discourage smoking and 26.8% for educational programs. Koç and Aslan (2014) also mention how "only 10.4% of participants said they smoke away from smoke-free zones because of warnings" (p. 165). This suggests that new methods of informing the public about smoking policies, other than current signage practices, may be required and that it is important to consider different advertisement for

staff members who are more directly and frequently influenced by the policy (Galloway, 1988). This would include notifying the public of the progress of policy once it has been implemented, providing training for staff on ways to deal with an individual who does not comply with the policy and creating an open dialogue for people following policy to voice their thoughts. Multi-strategic hospital-wide interventions (educational meetings, mass media, reminder system, educational material) may be effective in smoking cessation (Poder et al., 2012, p. 161).

When advertising the smoking policies to the public, Galloway (1988) explains the importance of using a positive tone in the various forms and usages of media. Furthermore, the location of public signage can be informed with the smoking heat map (See Appendix B). The heat map may indicate locations that educational signage may be centralized for the greatest public exposure. This will allow for the greatest exposure of the information to the individuals who smoke in the area.

The survey results show a discrepancy between the high amount of people who think smoke-free zones are needed on campus and the low amount of people who are aware of the effects of second-hand smoking on one's health. In other studies, it is shown that 20.3% of participant say that second-hand smoking will not affect others and 47.3% who say that it doesn't have substantial effect (Koc & Aslan, 2014). Additionally, 61.5% said they did not smoke in these areas because it may negatively affect other people.

Another discrepancy is that there is a high percentage of people who do not smoke due to the negative effects it has on other people's health yet a high percentage of people who believe that there are no substantial effects of second-hand smoking on others individual's health. This shows the importance and need for greater awareness on second-hand smoking through various forms of public education. Relaying the information to the public is also important in setting one's expectations and as such, a campaign strategy prior to implementation of policy may contribute to its success. This also gives time for the public to respond to the change in policies

and potentially have a dialogue regarding the reason why this change is being proposed.

Communication must be addressed not only during the initiative and implementation of the smoking policy, but throughout its implementation to ensure regular communication and feedback about its effectiveness (Nykiforuk et al., 2010). This is important because "the clearer and more definitive the policy [is], the less enforcement will be necessary. For example, enforcing a smoke-free buffer zone around entrances is more complex than denoting it as a smoke-free zone" (Nykiforuk et al., 2010, p. 40).

Many variables influence smokers' compliance to smoke-free policies, but Lazuras et al., emphasize the importance of how perceived health risks of smoking and the belief of smoking benefits when determining compliance (2012). This reiterates the importance of education in changing these individuals' health perception and beliefs, which may consequentially change smoking behaviour. Lazuras et al. suggest to target the beliefs about the health consequences of using tobacco of smokers in order to support tobacco control policies (2012). The results that target smoker's belief on tobacco's effects showed positive benefits in the case studies in Greece and Bulgaria.

Gaps in research concerning bylaw timing and assessing community readiness for change in current climate must be addressed where smoke-free spaces have become more prevalent (Nykiforuk et al., 2010). In short, there must be a strong understanding of the educational gaps by the community in order to most effectively implement educational strategies.

Recommendation 2: Creating Social Norms and Increased Accountability

Currently, there is no formal, top-down enforcement at UBC for the cessation of smoking behaviours. As such, the non-smoking behaviour must be created from the bottom-up and intrinsically rather than externally in order to modify social norms of accountability. Wetterer and Troschke speak to the advantage of focusing on social norms rather than enforcement, saying that "codified laws are actually of little importance with respect to an individual's choice whether to smoke or not. Less formal, social values play a much greater role in determining when, and under which conditions, smoking is considered socially acceptable behaviour" (1986, p. 40). In addition, Lazuras et al. say that "smokers" who reported non-compliance with smoking bans were significantly associated with greater perceived social acceptability of tobacco use, and held less regret from harming non-smokers' health through exposure to SHS" (2012, p. 770). These studies show the value of understanding and using social norms to help shape behavior.

Although education can help the public understand the issue at hand and may change their own actions, this focuses the issues solely at an individual level. Social norms are an amalgamation of multiple people's behaviour, attitudes and expectations and must be viewed at a systemic level in order for it to sustain over the long term. Ratschen, Britton and McNeill say that the "main challenge of smoke-free policy implementation in hospital settings lies in its sustained enforcement" (2008, p. 6). It requires the support and drive for policy monitoring and the evaluation must come from the academic and public health communities (Nykiforuk et al., 2010).

In order to help create and maintain a social norm of compliant smoking behaviour with the current policies, training programs for the staff are recommended. Poder et al. say that staff are often scared to ask people to go off grounds due to fear of aggression by those they confront (2012). It is intimidating or burdensome for staff to enforce current smoking policies to individual who are both aware and unaware

of their behaviours. This may be a consequence of the fear for repercussions as well as the belief that their action will not change the uncompliant smoking behaviour. However, training programs can help to develop the necessary skills in order to effectively enforce policies with people who do not comply. According to Lazura et al., there are three main factors to consider when helping employees create the norm: attitude towards assertiveness, social norms, self-efficacy (2012). First, attitude towards assertiveness is the acceptance and positive view of being assertive in order to enforce the smoking policies in the workplace. Secondly, social norms refer to the general acceptance of behaviour or attitude by the majority. Lastly, self-efficacy is the ease to speak to a topic, and in this case the ability to easily ask an individual (who is smoking) to stop with a certain behaviour. Lazuras et al. explains how "efforts to convey-anti-smoking normative messages and strengthen self-efficacy skills can empower non-smokers to be more assertive" (2012) which a self-enforcing and smoke-free system would be striving towards. Thus, it is encouraged to promote non-smokers assertiveness in order to create stronger assertiveness-related attitudes, convey anti-smoking normative messages, and strengthen self-efficacy skills. In addition, an enforcement model that may be further investigated is that of UBC's Residence Life that require their staff to enforce smoking policies at a grassroots level to the residents.

This second recommendation supports recommendation 1 of increasing education in terms of creating a general understanding of the negative effects of second-hand smoking. An increase in education on the health effects of smoking may foster "a greater concern about the health effects of exposure to second-hand smoking was linked to acting assertively and asking smokers not to smoke" (Lazuras et al, 2012, p. 770). Yet it must be cautioned that assertive intentions may not necessarily lead to assertive behaviours as knowledge about the consequences of smoking may not translate into action. This again reemphasizes the importance of training programs to ensure that intentions translate to behaviours.

In addition, it is key that post-policy program implementation in the workplace is followed up with staff input and then feedback to inform the policy changes as needed. This can include workplace incentives, testimonials and positive feedback (Nykiforuk et al, 2010). This allows for continuous feedback to those who are enforcing the policy and helps to keep them involved in the process. Ratschen echoes this, stating how "effective enforcement is critical and more must be done to find better ways of supporting staff to engage effectively in enforcement, manage nicotine withdrawal and stop smoking on site" (p. 8). Nykiforuk suggests to develop a smoke-free policy that is integrated into a comprehensive workplace wellness strategy. This way, the policy would be supported by cessation supports for employees (Nykiforuk et al., 2010).

Lastly, an investigation on the literature on compliance alongside social norms would contribute to this study as it directly relates to the change in undesired behaviour. Although the context of this study does not allow for formal enforcement from a figure of authority on campus, there may be insights on how obedience or compliance can be fostered without a formal authority figure.

Recommendation 3: Designated smoke zones

It is recommended to create designated smoke zones on campus. Creating designated smoke zones may not necessarily change the smoking habits of people who smoke, but they may provide spaces on campus that increase the rate compliance to policies while also giving individuals the liberty to smoke. The heat map (See Appendix B) may be used to help plan appropriate locations for designated smoke zones within the HSP. Existing models of designated smoke zones are found on campuses such as UBC-O that currently uses gazebos which are covered structures where smokers are permitted to smoke. The designated smoke zones may reduce the exposure to second-hand smoke, decrease pollution, allocate appropriate resources to the needs of the individuals (ashtrays, cover, benches), provide a known space for smokers and create a place for healing within the HSP.

There seems to be conflicting attitudes between those who are strongly in favour of designated smoke zones and those who stand for the rights of smokers, viewing smoking as an addiction, especially patients who may be smoking for medicinal purposes. The solution may inevitably be a compromise which allows smokers to continue to smoke in areas that are convenient for them, yet in a way that does not pollute nor disrupt non-smokers.

These recommendations may not only help with the staff, patients and students who are affected by second-hand smoking and the pollution from the cigarette butts, but also benefits the smokers themselves as it may help current smokers with their smoking behaviours by creating a supportive environment. Koc says that creating smoke-free areas is "an easy and efficient way of increasing the population awareness about the health" and they "not only protect non-smoker employees, but also encourage the smokers for quitting smoking and decrease the incidence of smoking (Koc, 2014, p. 166).

It is important to understand the needs of the community while considering these three recommendations. In the context of UBC, this may be more interventions with smokers on campus and hearing their thoughts as to what would be most beneficial for them or what would be an appropriate trade-off. Additionally, Nykiforuk et al. (2010) say that understanding the community is especially important for communities who do not have the background information or knowledge on the key issues. They also say that although data of smoking rates can be helpful, it must much more important to understand the community and their needs and the specific context that they are in to move forward with these policies. Lastly, existing attitudes of the community should be assessed as it is this that determines "the degree to which smokers comply with existing smoking restrictions in public settings, as well as non-smokers' readiness to assert their rights for smoke-free air" (Lazuras et al, 2012, p. 770).

Limitations The challenge of managing smoke zones and smoking behaviour in public spaces is ongoing due to its complexity and context specificity. The challenge is further complicated given that the hospital is located on a university campus and many stakeholders share the space. It is this complex nature of this study that creates various limitation, the first being its representativeness. The individuals interviewed were mainly non-smokers and hence the data may not accurately reflect smokers' attitudes. More in-depth studies are recommended to gain a greater understanding of smokers' attitudes who use this space as the results from this survey may not be viable for other demographics who are affected by changes in policy such as smokers.

Although the data that was collected for the staff and students residing within the HSP is proportionate, it does not include the patients' or visitors' point of view. There is a limit to how representative the results are and would be more representative if the study included residents and guests. This is another area for further studies as these demographics will have to abide and comply to future policies. The responses from staff members were distributed around the HSP due to

the online distribution, yet student responses were focused mainly in the Woodward area and Life Sciences Building. Having students' perceptive focused in two locations may influence their responses as their perspectives may be limited to the areas they are most frequently exposure to. Hence, it is recommended that different areas within the HSP are studied in greater depth.

Psychological Variables

Below are various psychological concepts that may contribute to smoke-zones and policies and which are recommended to investigate further. Each concept is briefly described and linked to the research that has been conducted to provide potential areas for more in-depth research.

Obedience. Pascual et al. (2013) describe two psychological variables in their article. They refer to Milgram's studies on obedience and authority where "an individual, placed in a context where he is confronted with an authority recognized as legitimate, will behave in the direction of the expectation of this authority, whatever those expectations may be. One of the factors likely to have the authority perceived as legitimate might be the place in which that authority is exercised" (85). They also elaborate on Barker's idea of "Behaviour Setting" which states that obedient behaviour is influenced by the message sent to people. The result of Barker's study show that people tend to be obedience and throw away butts in areas that have symbols of authority surrounding them, even if authority does not explicitly request a behaviour (85). This research on obedience can be applied to the types of messages that are applied for educational purposes to the public once the policy is established.

Compliance. Compliance, specifically compliance without pressure when there is no force to create a behaviour, is another variable to be further examined. The first grasp of this concept comes from Freedman and Fraser's "foot-in-the-door" process

where someone ask another person to do something minor, and then the following larger request is more likely to be complied to rather than jumping to the larger request initially. This is likely help create a sense of ownership of their own action is key. In addition, enacting behaviours under the impression of one's own free will can be done by using the term "but you are free to…" or BYAFT (86). This will help to increase the acceptance of the request. However, there is a caveats to this theory in that the BYAFT effect is not present when the requester of the change of behaviour is absent.

Social Norms. Galloway (1988) speaks to the concept of social norms. It is what is accepted or average in our society, which usually occurs over a number of years or decades. He explains how this can be changed by "making others aware of the rules for smoking in your home and car, those who smoke and those who do not know what to expect and there is less need for resentment on either part" (p. 39). This variable touches upon the recommendation of educating the public so that the social norm forms. In addition, prior knowledge before the policy implementation is key as it helps to set expectations before acting so that people are not off guard to the change (p. 40).

Conclusions

This report investigates the smoking policies and behaviours within the HSP at UBC-V. The data collected from a field observation and the administered survey showed several trends. There is a large proportion of the survey participants who are in favour of designated smoke zones for health and environmental purposes. There are mixed views on the rate of compliance of the current 8-meter smoking policy, and there are doubts in the ability of the public to comply to future smoking policies. There is also a consensus of people who feel that increased infrastructure, signage and designated smoke zones would be helpful in decreasing smoking behaviours. Considering these results, we recommend a greater effort put towards informing the public for increased awareness of smoking policies, to foster a bottom-up enforcement through a social norm approach and to implement designated smoke zones on campus.

Various questions remain, providing the opportunity for future areas of research. An investigation of the attitudes of designated smoke zones and current smoking policies for people who smoke within the HSP is a key area to further explore. In addition, it is important to continue investigating the capacity that the staff and facilities within the HSP has in adopting the recommendations presented in the report. Finally, testing people's compliance to new and consistent signage and designated smoke zones are future steps to be taken once if the implementation of such signage and designated smoke zones are paths that which to be taken.
It is crucial to continue to investigate smoking zones and attitudes on campus as addressing this campus-wide challenge has the potential to influence the culture of the university in terms of health and wellbeing. Members of the UBC community have expressed interest in this area of study and gratitude for the attention that is being brought to this sustained issue. The evolution of social norms and culture is not instantaneous, and it is for this reason that we must continue to push and expand upon this research to address the challenge that the students, staff, patients and visitors of the university will encounter.

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Appendix A – Survey

Areal Scope of the Health Sciences Precinct

Response	Chart	Percentage	Count
Choice 1		100.0%	8
		Total Responses	**8**

What is your association with the University of British Columbia and/or with the Health Sciences Precinct?

Response	Chart	Percentage	Count
University staff		52.0%	89
UBC Hospital staff		0.0%	0
Student		45.0%	77
Faculty		2.3%	4
Other, please specify...		0.6%	1
		Total Responses	**171**

What is your association with the University of British Columbia and/or with the Health Sciences Precinct? (Other, please specify...)

#	Response
1.	Prospective Student

Which building within the Health Sciences Precinct do you spend the most time in ?

The 166 response(s) to this question can be found in the appendix.

Do you currently smoke tobacco product(s)?

Response	Chart	Percentage	Count
Yes		4.7%	8
No		95.3%	162
		Total Responses	**170**

If you answered yes to the previous question, in which area within the Health Sciences Precinct have you ever smoked? (refer to the map below). Please check all that apply.

Response	Chart	Percentage	Count
Patient Park		0.9%	1
Dentistry Courtyard (open space between IRC and JB Macdonald building)		1.8%	2
Health Sciences Courtyard (open space between IRC and DH.Copp)		0.0%	0
Hospital parking lot		0.9%	1
Sidewalks / walkways / Hospital Lane		0.0%	0
All of the above		1.8%	2
Other, please specify...		0.0%	0
I smoke but I've never smoked in the Health Science Precinct		2.7%	3
No I don't smoke		93.6%	103
		Total Responses	**110**

If you answered yes to the previous question, in which area within the Health Sciences Precinct have you ever smoked? (refer to the map below). Please check all that apply. (Other, please specify...)

Area reference map

Response	Chart	Percentage	Count
Choice 1		100.0%	6
		Total Responses	**6**

Where do you usually see people smoking around the Health Sciences Precinct? (refer to the map above). Please select all that apply.

Response	Chart	Percentage	Count
Patient Park		18.8%	32
Dentistry Courtyard		22.9%	39
Health Sciences Courtyard		22.4%	38
Hospital parking lot		22.4%	38
Sidewalks / walkways / Hospital Lane		37.6%	64
All of the above		13.5%	23
Other, please specify...		12.9%	22
I don't see people smoking		17.1%	29
		Total Responses	**170**

Where do you usually see people smoking around the Health Sciences Precinct? (refer to the map above). Please select all that apply. (Other, please specify...)

#	Response
1.	Outside, underneath the stairwell of a lecture theater, facing the health sciences courtyard. Not even a meter away from the building of IRC.
2.	IRC
3.	In the area near the front of Detwiller Pavilion
4.	In and around campus - basically everywhere, but mostly I see people outside of buildings and the hospital
5.	I only travel from UBC hospital bus stop to SPPH, and sometimes see people smoking in areas next to UBC hospital
6.	At the entrances and often under cover next to the doors to Woodward Library and IRC
7.	The area between Woodward Library and Biomedical Research.
8.	Benches between Purdy & Detwiller
9.	In the sheltered area, outside the UBC Hospital bike cage.
10.	Hospital cafeteria front entrance
11.	Area 6
12.	as they exit the Health Sciences parkade
13.	I don't pay attention to it as it isn't an issue
14.	I see people smoking but I don't remember where.
15.	Path behind Lsc
16.	At the bicycle racks near the entrance to the underground parking beneath the David Strangway Building.
17.	In the undercover area between Strangway and the Dentistry buildings, and the parking area there.
18.	Between the cafeteria and IRC

19.	Between Detwiller and Purdy Pavilion
20.	Area 6, behind Wesbrook Building.
21.	Irving
22.	courtyard between Chem bio, mcgavin and donald rix

How often have you been exposed to second-hand smoke when you are in the Health Sciences Precinct?

Response	Chart	Percentage	Count
I have never been exposed to second-hand smoke in the area		13.6%	23
Rarely (less than 3 times a month)		43.2%	73
Sometimes (around 1-2 times a week)		32.5%	55
Often (more than 4-5 times a week)		10.7%	18
		Total Responses	**169**

UBC policy states that smoking is prohibited within 8 meters of a building. Based on your experiences, how would you relate to the following statement:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total Responses
"I often encounter people who comply with this policy"	15 (8.8%)	42 (24.6%)	44 (25.7%)	55 (32.2%)	15 (8.8%)	171

If the Health Sciences Precinct were to be made into a smoke-free zone, would you support this decision?

	Definitely Not	Likely No	Neutral	Likely Yes	Definitely Yes	Total Responses
	6 (3.9%)	12 (7.9%)	13 (8.6%)	28 (18.4%)	93 (61.2%)	152

If you are inclined to support making the precinct into a "smoke-free zone", which of the following do you consider the most important reasons?

Response	Chart	Percentage	Count
Reduce exposure to second-hand smoke		90.5%	134
Aligns with the mandate and health-promoting purpose of Health Science area		56.8%	84
Decrease cigarette wastes		42.6%	63
Minimize social impact of smoking		31.1%	46
Contribute to campus wide sustainability initiatives		27.7%	41
Other, please specify...		2.7%	4
		Total Responses	**148**

If you are inclined to support making the precinct into a "smoke free zone", which of the following do you consider the most important reasons? (Other, please specify...)

#	Response
1.	its awful to have to walk through people smoking to get to work if you are a non-smoker. It stinks and I don't want the second hand smoke smell on me.

#	Response
2.	Compassion for people who might get cancer?????
3.	Align with mandate of UBC/Health of Society
4.	I hate seeing patients smoke. It's brutal

If you incline to be against making the precinct into a "smoke free zone", what is the reason?

Response	Chart	Percentage	Count
It is inconsiderate of smokers' right		26.9%	14
Smoking behaviors has already been well-regulated through current policies		36.5%	19
There would be doubtful compliance		50.0%	26
It's financially unfeasible		3.8%	2
There are no ideal alternative locations for people to smoke		28.8%	15
Other, please specify...		15.4%	8
		Total Responses	**52**

If you incline to be against making the precinct into a "smoke free zone", what is the reason? (Other, please specify...)

#	Response
1.	The smokers I encounter are patients at Detwiller. My understanding is that smoking is beneficial for patients who have schizophrenia. It's important that they be allowed to smoke close to their ward. As well, I think curent policies are reasonable for both those who smoke and those who don't.
2.	Smoking is an addiction and it's not an easy thing to quit. When a smoker is ready to quit they will quit.

3. Smoking I can tolerate. It's the littering I find unacceptable.
4. it would make people who smoke take really long breaks to get to a zone where they can smoke...
5. Many patients smoke as a stress or pain reliever. We should provide at least one area for it, otherwise they will find their own. VGH has tried the same and failed.
6. Smoking is an addiction. Addicts should not be alienated from healthcare.
7. There should be designated areas with an ash tray so people put there butts there instead of on the ground. It would also be an area in which people that don't like second hand smoke can avoid.
8. my mom smokes and when she was at the hospital it was annnyoing finding her a place to smoke

Do you think there should be designated area within the Health Science Precinct where smoking tobacco products is allowed?

Response	Chart	Percentage	Count
Yes		60.0%	96
No		40.0%	64
		Total Responses	**160**

Reference map

Response	Chart	Percentage	Count
Choice 1		100.0%	1
		Total Responses	**1**

If there are designated smoking areas in or near the Precinct, which of the following would be the desirable location(s)? Please check all that apply: (reference map above)

Response	Chart	Percentage	Count
Inside the Precinct, Area 3: patient park where there are existing ashtrays		31.0%	44
Inside the Precinct, other open green spaces (Area 1/2/6)		10.6%	15
Inside the Precinct, somewhere around Hospital Parking lot (Area 4)		16.2%	23
Inside the Precinct, other secluded corners		13.4%	19
Outside the Precinct, nearby open spaces (area 7)		28.9%	41
Outside the Precinct, far away		25.4%	36
Other, please pitch your idea here..		10.6%	15
		Total Responses	**142**

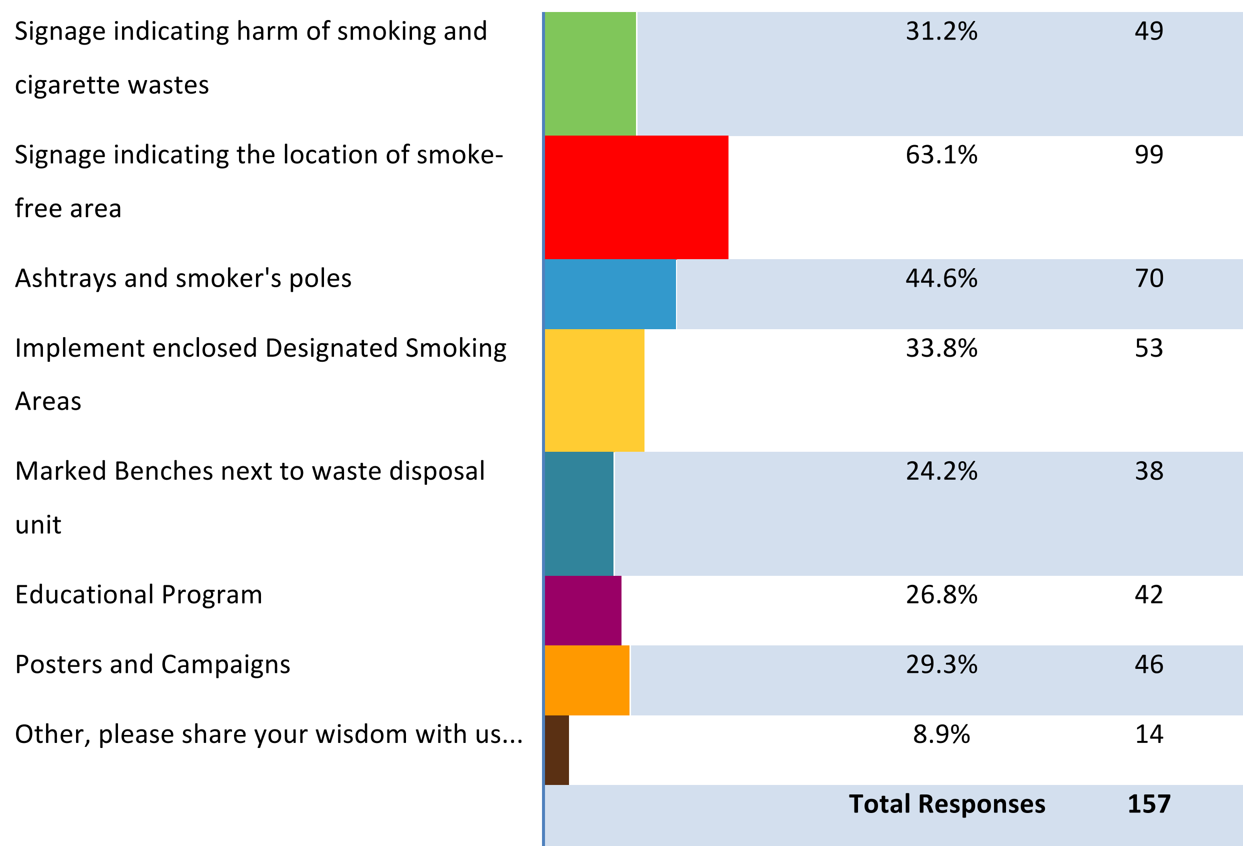
If there are designated smoking areas in or near the Precinct, which of the following would be the desirable location(s)? Please check all that apply: (reference map above) (Other, please pitch your idea here..)

#	Response
1.	Out of campus
2.	I am not sure where - but I don't like these proposed areas.
3.	Somewhere under cover/shelter from the elements with ashtrays
4.	People are not going to walk 15 min from their office to have a smoke they will just hide somewhere close to their building. Make the area's in close but not far from common areas

5.	The smokers I typically see are people who are in/out hospital patients and/or visitors to the hospital. Whatever area is established needs to be convenient to this user group.
6.	There should be more than 1 designated area. Keep in mind when it rains, smokers tend to smoke under a rooftop regardless of rules.
7.	Underneath back alley stairwells, alleyways, the ugly and dirty areas of campus where cigarette butts won't hinder the beauty
8.	As we're in the Health Science precinct we really not be promoting smoking as it goes against what we teach people. Also we shouldn't be exposed to second-hand smoke. It harms our health! Campus should be non-smoking environment.
9.	None. Smokers should not be allowed to smoke anywhere on campus. Take a hard stance and don't condone it anywhere. If you have to offer a desginated location, make it an enclosed closet, perfectly sealed with no ventilation so they have to inhale their own 2nd hand smoke.
10.	I'M NEUTRAL
11.	secluded areas that are not near pathways of any sort.
12.	I would like to see signage letting the smokers know where they can go. While I agree it is not great to promote smoking, these people should have a place to smoke. The more we can promote that area, the better.
13.	It often rains in Vancouver. Smokers won't smoke in the rain. Is it possible to harness the natural circulation of airflow around buildings to create covered yet 'vented' smoking areas?
14.	Near or in the parking lots where nons-smokers spend very little time.
15.	Between Purdy and Detwiller

In your opinion,what would be useful to discourage smoking / to direct smokers to appropriate smoking locations ?

Response	Chart	Percentage	Count



In your opinion,what would be useful to discourage smoking / to direct smokers to appropriate smoking locations ? (Other, please share your wisdom with us...)

#	Response
1.	Campus free smoking area
2.	Enforcement for those who don't comply (a fine). A sign won't do anything. People often look at the "smoke-free area" signage while smoking.
3.	I am not sure I agree with "discouraging" them - they need to want to change, but I think by reducing the ability to smoke - it would move in the right direction
4.	Signage indicating where smoking area is permitted
5.	There will be smokers, in inclement weather, so they need a sheltered spot to go that is away from the buildings and non-smokers. There are many visitors, around the hospital, who won't be reached by education programs and poster campaigns.

6.	Campus security monitoring smoke free areas and police fining smokers for littering when they butt out
7.	Put up "No Smoking Here" signs. Or just put them in a room where they can smoke (like those found in airport lounges).
8.	Making a definitive and strong stance of a No-Smoking policy on campus means consistency: if smoking is bad for the individuals, for others around those individuals, for the environment then it is counterproductive and even double-standard to provide designated smoking areas and/or to have ashtrays, smoker's poles etc. It is important not to have inconsistent messaging when it comes to public health.
9.	Heavy fines, public shaming,
10.	fines for non compliance
11.	Signs letting people know how they can get help to quit, incentives.
12.	all of the above, AND enforcement of the rules.
13.	Quitting smoking tools for free (ie. Patch)
14.	Just make sure the area is covered, for rainy days.

Do you have any additional thoughts / comments that you would like to share regarding smoking behaviour in the Health Sciences Precinct? Please write about them here:

The 35 response(s) to this question can be found in the appendix.

Response	Chart	Percentages	Count
support		0	0

Do you have any additional thoughts / comments that you would like to share regarding smoking behaviour in the Health Sciences Precinct? Please write about them here: |

#	Response
1.	No smoking signs should be added to every door, regardless of it being a main door.
2.	Ban smoking in UBC !!!
3.	Although I don't smoke, do not like second-hand smoke, and appreciate smoke-free buildings, restaurants, and airplanes, I think that negative reinforcement behavioural strategies have limited and harmful effects on those who smoke. I think education with a focus on what everyone wants -- health, wellness, and happiness -- is more motivating and is a longer-term, better solution than trying to control or restrict a behaviour. What if we look at the root reasons people smoke (to relieve stress, weight control, addiction, social image, etc.) and put our energy and resources into addressing these root causes.
4.	Don't allow people to smoke here. It's a gross habit and non-smokers shouldn't be exposed to other people's choices.
5.	N/A
6.	FOR THE MOST PART IT IS THE STUDENTS THAT SMOKE DIRECTLY OUTSIDE (WITHIN THE 8 METERS RANGE) THE BUILDINGS NOT STAFF OR FACULTY
7.	I think this is a University wide issue and should be a University wide campaign to have designated smoking areas on the entire campus. I am glad the the Health Sciences Precinct is taking the initiative to look at this issue.
8.	Smoking is an addiction. If it were that easy to quit there wouldn't be an issue but to shun smokers that's what gets me angry. If you or a family member or friend have ever had an addiction you should understand.
9.	Thank you for conducting this survey! As one the Sustainability Coordinators in the Library I am very interested in this topic as it has been raised as a concern by library staff.
10.	Usually only notice smokers in the hospital breezeway area, but I don't spend much time in other areas of the HS Precinct.

11.	This is a difficult survey, as people smoking 8 m, away can often still be a nuisance depending on how the wind is blowing, and even when people are 8 m. from an entrance the smoke can still circulate over to the entrance.
12.	Majority of smokers can care less where they smoke regardless of rules. Smokers enjoy there habit regardless of smoking rules.
13.	Consideration needs to be given to smokers, especially hospital patients that are probably often visiting the hospital due to poor health caused by smoking. Smoking areas should be accessible but out of the way of nice courtyards and high foot traffic areas.
14.	Smoking seems to have decreased in recent years. However, I think more advertising geared to young people, showing the negative consequences of smoking should be out there on social media, and entertainment channels.
15.	Just like a scent-free policy, that there are no scent-allowed zones neither should there be designated smoking areas. Clear signage in stating UBC is a smoke-free environment needs to be posted visibly. Overtime people who work, live or visit the campus will understand this is part of the ethos of the university.
16.	I think smoking should not be allowed on campus. Period.
17.	No
18.	I find the butts around the campus very unsightly; some are very close to doorways, so people are not always adhering to the distance from doorways. Is there some incentive of paying people 2-5 cents per butt; similar to pop cans or a sign stating a stiff fine for littering. Some people light up when they are exiting or entering the parkades and the smoke is not pleasant to walk through; I usually hold my breath!
19.	This initiative is highly important. Thank you for this!
20.	It would be good to have a few secluded areas out of the rain for smokers, spread around so that people don't have to walk too far.
21.	Smoking rules should also relate to weed. I don't want to smell that everywhere I go.
22.	"Share your wisdom with us" is very patronising. Consider rewording this part of the survey.

23.	It's a difficult topic. We need to respect smokers' rights to smoke, yet ensure that the air is kept clean and cigarette butts properly disposed of. I support a designated smoking area.
24.	It happens too often next to pathways that are well-utilized. If smoking is to be allowed, it needs to be secluded and away from foot traffic. Exposing citizens, workers and other patients to 2nd hand smoke in a health precinct area seems counter-productive.
25.	Just that with the widely known consequences of smoking I am truly surprized that people still smoke.
26.	
27.	I appreciate you consulting with staff. While I don't endorse smoking tobacco products, people have the right to make these decisions if they like.
28.	I think "vaping" should be included with the cigarette smokers.
29.	No
30.	Smoking should be allowed in certain areas but not all
31.	I do not smoke, but I believe that people should have the freedom to smoke. However, smoking should not be done near a mass of people due to second hand smoking. Smoking should also be done in an open area for the place to be ventilated rather than stained.
32.	None
33.	Second hand smoking actually is worse than first hand so they should have designated areas to smoke so others won't be affected
34.	I think we should be a smoking free University
35.	None

Appendix B – Heat Map

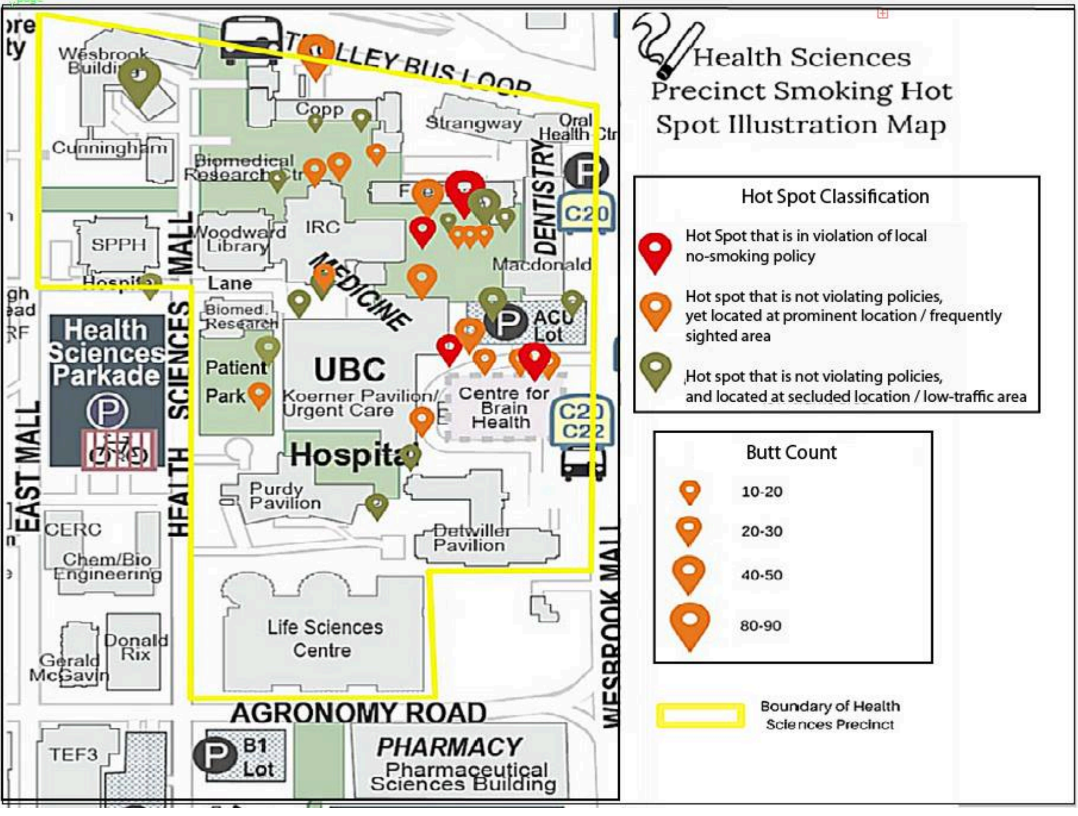


Figure 12: Health Sciences Precinct Smoking Heat Map