

**The Influence of Public and Media Attention on Policy:
Applying the Issue-Attention Cycle to Radon in Canada**

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Abstract

Radon is the second leading cause of lung-cancer in Canada. This colourless, odorless, tasteless, radioactive gas can seep into homes through the cracks, joints, and gaps in the foundation. Radon gas can accumulate and when inhaled exposes a person's lungs to alpha radiation and the products of the radon decay chain. Stakeholders across the country encourage radon testing and mitigation in an effort to address the second leading cause of lung cancer in Canada. Awareness campaigns such as Radon Action Month work against the dynamics of public attention as described by the issue-attention cycle and have potential agenda-setting implications.

This research examines the influence of public and media attention on policy attention and subsequent policy action or inaction. The issue-attention cycle predicts that an increase in public attention to a problem raises awareness of the problem among policymakers and applies pressure, influencing policy attention and action. The multiple streams approach to agenda-setting integrates the agency of a policy entrepreneur, who promotes a policy idea, as well as describes the conditions that open a policy window, or the opportunity for policy action. It is proposed that the issue-attention cycle can open and close a policy window.

The issue-attention cycle is applied to the human health risk of radon gas and the multiple streams approach to agenda-setting further augments the analysis. A review of traditional media, internet search trends, policy documents, and semi-structured interviews measures media, public, and policy attention. Policy action is measured through all proposed bills, passed or not, and regulations. Data is collected at the federal, provincial, and municipal levels of government and presented in time-series. Two periods of intense public and media attention are focused on for analysis, the first in 2014 and the second in 2017. The results indicate that attention to radon peaks sharply, but often lacks the gradual decline as described by the issue-attention cycle. Despite the dynamic of attention being different from the issue-attention cycle, there is still evidence that the increase in media and public attention influenced policy attention. Following the peak of attention in 2014, it is found that the National Radon Program was more successful at engaging provinces, municipalities, and other stakeholders such as lung associations. No policy entrepreneur is identified during this period of attention, and no policy action is measured. However, in 2017 policy action is measured as Alberta passed Bill 209 – *Radon Awareness and*

Testing Act. A policy entrepreneur is proposed to exist in the province of Alberta but due to the limitations of this research it cannot be confirmed.

This research adds to existing agenda setting knowledge, by applying concepts that have seen limited use in the Canadian context. The use of internet search trends is a modern measure of public attention that is direct and continuous. The measure can continue to contribute to policy research and the understanding of the competition for attention. In addition, much of the work in the radon space is to raise awareness and encourage testing and mitigation. Other similar issues could benefit by learning from the strategies employed to overcome biases and the use of media as a tool for building awareness.

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Dedication

I dedicate this thesis to Keno. All he wants are cookies.

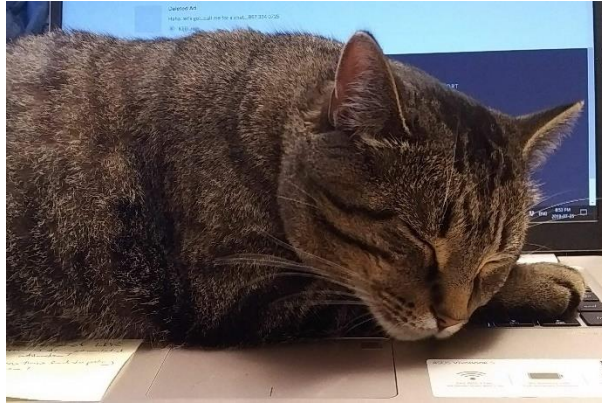


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List of Abbreviations

AARST-NRPP	American Association of Radon Scientists and Technologists
ARELLO	Association of Real Estate License Law Officials
C-NRPP	Canadian National Radon Proficiency Program
CARST	Canadian Association of Radon Scientists and Technologists
CELA	Canadian Environmental Law Association
IARC	International Agency for Research on Cancer
ICRP	International Commission on Radiological Protection
NBC	National Building Code
NORM	Naturally Occurring Radioactive Materials
RECA	Real Estate Council of Alberta

Chapter 1. Introduction

1.1 Public Attention, Public Perception, and Policy

Public perception of risk is often different from expert perception of risk. The obvious divide in knowledge between experts and the public might be the first assumption for the divergence in risk perception, but risk perception is much more complicated than that. Public perception is seemingly intertwined in social identity, social learning, and previous knowledge (Wynne 1992, Sjöberg 1999, Perko 2014). For this reason, how the media communicates and portrays information is important to its uptake and acceptance. Online access and social media present new ways of interacting with audiences and sharing information. Media institutions have recognized this and created new ways of publishing and interacting with news media online. For example, following the 2011 Fukushima nuclear power plant incident the New York Times released an interactive map showing areas of evacuation and estimated radiation levels (Cox et al. 2011). Furthermore, in 2014 CBC produced an interactive map showing where the risks from radon are expected to be elevated as a way of increasing public awareness (Pereira 2014).

Media plays a critical role in communication between the government and the public. The role has multiple functions and is defined differently by different authors, such as a role of liaison (Siebert, Peterson, & Schramm 1956). It is often the case that experts and governments use media to disseminate information, including scientific information, by means of awareness campaigns, news broadcast, traditional print newspaper, or other mass communication. The connection between media and government was identified by Neuman (1990) as a dependent relationship; the government relies upon media to communicate its agenda to the public. Correspondingly, the media is thought to reflect the public attitude, from which decision-makers can infer the public's perception of an issue.

No consensus has been drawn on the exact relationship between media, public opinion, and policy. A frequently used quote to demonstrate the relationship comes from Cohen (1963, p. 13): news media 'may not be successful much of the time in telling people what to think, but [they are] stunningly successful in telling readers what to think about'. In this way the media sets the "unofficial" agenda with the public. It draws their attention to a particular issue and may successfully mobilize some citizens to change behaviours. A few issues gain enough momentum to become a part of the "official" policy agenda. Models such as the issue-attention cycle

(Downs 1972), or punctuated equilibrium (Baumgartner and Jones 1991) try to capture the relationship between media, public opinion, and policy. This research considers the link and applies the issue-attention cycle to explore agenda setting and the mechanisms by which an issue gains attention.

1.2 Statement of Purpose

The objective of this research is to explore the influence of public and media attention on policy attention. By applying the issue-attention cycle periods of heightened public and media attention were identified. Semi-structured interviews provided further insight into these occurrences and added to the discussion of policy attention, action, and inaction. The issue-attention cycle was supplemented with the multiple streams approach to agenda-setting which introduced the agency of the policy entrepreneur and the opportunity for policy action during an open policy window (Kingdon 2003). The analysis of this thesis focuses on peaks in attention in an attempt to discern an issue-attention cycle and assess if it aligns with the possible opening of a policy window.

This research applies the issue-attention cycle and multiple streams approach to the issue of radon in Canada. Radon is a naturally occurring radioactive gas that is colourless, odorless, and tasteless. Radon can accumulate in enclosed places, such as homes, and can reach concentrations that present a health risk. Following tobacco smoking, radon is the second leading cause of lung cancer in Canada, attributed to roughly 16% of lung cancers (Chen et al 2015). The Canadian National Radon Guideline is 200Bq/m³. The unit becquerel per meter cubed is a measure of radioactivity per volume, where one becquerel is one decay per second. It is recommended that remediation occur at any level above the guideline with urgent action being taken if the level of radon is more than 800Bq/m³. Compliance is voluntary, and it is the responsibility of the homeowner to test for radon and mitigate if necessary.

As a natural source of radiation, the public perception of radon is expected to affect the associated attention and action. Radon does not present an imminent danger, instead the risk is due to long-term exposure, allowing the public and policymakers to more easily ignore the issue. As a policy issue, radon is multi-jurisdictional and a part of the health portfolio in competition with many other pressing issues. There are many factors which affect the intensity of attention

radon receives. The accomplishments and challenges of raising radon awareness and elevating an issue on the agenda are explored.

1.3 Thesis Structure

This thesis consists of 6 chapters. This chapter introduced the research question and objectives. Chapter Two offers a literature review, develops the conceptual framework, and communicates the narrative of radon in Canada. Chapter Three covers the research methods and hypotheses and an explanation of how attention and action are to be defined and measured. Observations of the measured media, public, and policy attention and action are detailed and presented in figures in Chapter Four. Chapter Five begins with the discussion and analysis of the hypotheses presented in Chapter Two. This is followed by a further examination of the interaction between the issue-attention cycle, policy entrepreneurs, and policy windows. Finally, a summary of the findings, implications, and further research opportunities are in the concluding Chapter Six.

Chapter 2. Theoretical and Subject Background

Agenda setting is intriguing due to its random nature. Many concepts have tried to capture this characteristic. Agenda setting refers to the process of an issue achieving government attention and subsequent policy action. In some versions of the policy cycle agenda setting also includes problem definition. This research explores the issue-attention cycle (Downs 1972) within a broader theory of agenda setting, that is Kingdon's (2003) multiple streams approach.

2.1 The Issue-Attention Cycle

In 1972, Downs proposed the issue-attention cycle as a model to describe the wave of public attention an issue may receive. His article discusses the various actors, the reaction of the public, and the implications this wave, in attention, has for policy.

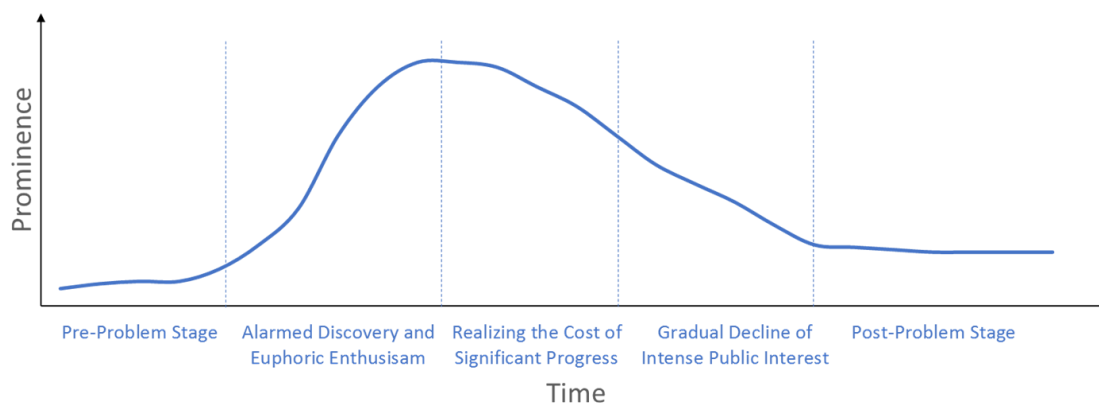


Figure 2.1. The issue-attention cycle.

There are 5 stages to the issue-attention cycle describing the dynamics of public attention, they are illustrated in Figure 2.1 and described here:

1. **The pre-problem stage:** refers to when the issue is not well known by the general public, instead there are only a few experts and interest groups who are aware of the problem.
2. **Alarmed discovery and euphoric enthusiasm:** refers to the uptake of the issue by the general public, a sudden increase in attention, and the belief that a solution can be easily found and applied to the problem.

3. **Realizing the cost of significant progress:** refers to the public's realisation that the solution to the problem is not simple. The solution will come at a great cost that is both monetary and a loss of privileges. This will lead to stage four.
4. **Gradual decline of intense public interest:** will occur as the realisation of true cost will leave the public feeling discouraged, threatened by the implications of the problem and solution, or more often bored by the issue.
5. **The post-problem stage:** refers to the level of public attention the issue returns to and will likely remain at for a prolonged period of time. This likely will differ from the pre-problem stage.

When an issue passes through the cycle, the increased attention raises awareness of the problem and applies pressure to policy makers influencing policy attention. Interest groups may form non-governmental institutions to advocate for, or against, an issue. Similarly, government may reorganize or create new institutions to address the issue or take policy action by proposing new bills that partially or fully address the issue. However, as the issue moves further along in the cycle the public begins to lose interest and policymakers realise a solution is difficult, expensive, or politically unappealing to pursue. Attention to the issue then wanes and pressure for policy action subsides. Thus, an issue may pass through the cycle without receiving any policy action, remaining unresolved.

Issues compete for the limited amount of time and resources that are the public's attention. If, by nature an issue is boring this decreases the likelihood of public awareness, as well as decreases the likelihood of the issue receiving policy attention (Kingdon 2003). Crises, exogenous factors, and new knowledge can raise the public's awareness of an issue. Additionally, how the media communicates and interacts with the public regarding an issue can contribute to the ebb and flow of public attention (Downs 1972).

Not all societal problems will go through, or need to go through, the issue-attention cycle. Prominent and visible issues will receive policy attention and action by other drivers (Kingdon 2003). Three characteristics of an issue can distinguish if it is susceptible to an issue-attention cycle (Downs 1972). These are issues (1) that adversely affect a small group of the population (2) through an arrangement which benefits the majority or a powerful minority and (3) do not persist in media coverage. These characteristics allow the issue to rise to prominence in the media, but do not allow for it to have continued coverage. As the majority isn't negatively

affected by the issue, they are not reminded, and so they can remain mostly ignorant. Addressing the problem requires sustained effort and may be felt as a threat to some or a loss of privileges for others. Exciting or dramatic issues can sustain media attention, and thus fail to flow through the complete cycle, but instead remain at one stage or another.

2.1.1 Literature Review

The issue-attention cycle has been studied typically in two different ways, by trying to replicate the model or by applying it in a new context (Dyussenov 2017). Those who try to replicate the model often modify it in some way either by adding or removing stages or changing the features of the issues which go through the issue-attention cycle. The issue-attention cycle has been applied in different contexts, to other social problems, and in several countries. Dyussenov (2017) presented a literature review of such existing studies, identifying studies in the UK and EU (Shackley & Evar 2012; Cram 2011; Park 1991), Germany (Lorcher & Neverla 2015, Waldherr 2014; Joppke 1991), Finland (Sormanen et al. 2016), France (Brossard et al. 2004), Sweden (Djerf-Pierre 2012; Djerf-Pierre 2013; Engstrom et al. 2008), Canada (Daw et al. 2013; Howlett 1997), Brazil (Ondetti 2008); Turkey (Uzelgun & Castro 2015), China (Anderson et al. 2012), Uganda (Semujju 2013), as well as studies of multiple countries (Schafer et al. 2014; Schmidt et al. 2013; Thogersen 2006). As this research applies the issue-attention cycle, similar literature was thoroughly considered. Research which sought to replicate or modify the model advised how the concept should be applied.

Yanovitzky (2002) used the issue attention cycle to discuss drunk driving within the US from 1978-1995. Yanovitzky (2002) was careful to distinguish in his work the difference between the effect of media on policy attention and the effect of media on policy action. This approach was to better capture the dynamics of the media-policy link, and both the external and internal factors which effect the policy agenda. He used content analysis of 3 major newspapers to represent the media and public attention and concern. Congressional hearings were used as a measure of problem attention within government (policy attention), and bills as a measure of policy action. All proposed bills were considered to better represent overall policy action, because for a bill to pass there are other external factors such as budgetary constraints that must align. Similarly, Howlett (1997) also employed content analysis but in the context of Canada with the subjects of nuclear energy and acid rain. He conducted a content analysis of debates and

committee reports of the House of Commons to measure policy attention. Documents were retrieved using the Hansard Index. Public attention was measured via content analysis of newspapers. Additionally, cross-correlation of the subsequent time series was performed to measure the extent to which public and government attention covary. Howlett concluded that the analysis conducted did not successfully identify an issue-attention cycle for nuclear energy or acid rain policy. However, several suggestions were made for future research including measures for the direction of correlation, ensuring that it is indeed public attention driving policy action.

Others have applied the issue-attention cycle more generally in the context of the US by using Gallup polls as a proxy for public attention to correlate with media attention and organizational changes as policy attention and/or action (Peters and Hogwood 1985, Neuman 1990).

Many of the existing issue-attention cycle studies have used proxy measures of public attention. Soroka (1999) argued that the use of these proxy measures is inaccurate and may be a factor in Howlett's (1997) inability to detect an issue-attention cycle in Canada. Agenda setting theories seek to capture the processes of how issues come to government attention but are not necessarily written to be testable. The underlying assumptions of the theory must be captured in the operationalization of the theory. Soroka points out that in Downs' description of the issue-attention cycle it is public attention which will have the characteristic sharp rise and slow decline. Using media attention as a proxy measure of public attention to test the issue attention cycle therefore may not capture an adequate dataset. The media agenda can vary largely from the public agenda depending on the type of issue, the magnitude of the affect, and the timing (Soroka 1999). Finding a dataset of public attention that is adequate for analysis was acknowledged as a difficult task by both authors, especially given time and budgetary constraints. In conclusion, both authors agree that future agenda-setting theories should facilitate investigation along with capturing the processes that bring an issue onto the agenda.

Methodologies other than content analysis were used to optimize certain trend and pattern finding properties and tools. Holt and Barkemeyer (2010) used text mining to explore media coverage of sustainability and climate change. Text mining allowed for data to be collected from 112 newspapers in 39 countries and in multiple languages. A far more diverse data set than what is typical of such research. Dyussenov (2016) applied the issue attention cycle to corruption in a comparative study of Kazakhstan and Canada. Using refined search techniques on the Google

search engine, data was collected from websites and other online sources and used as a measure of public attention. Legislation and court cases were used as the measure of policy action. This study had a few shortcomings, the most notable being the lack of discussion situating corruption within the three distinguishing features of issues that the cycle is applicable to. Issues that are likely to go through the issue-attention cycle typically affect a small portion of the population, by some arrangement which benefits the majority or a small minority, and do not persist in media coverage. New methodologies for the measure of public attention which go beyond traditional print media should continue to be explored and employed in the study of the issue-attention cycle. Social media as well as internet search engine trends present new and perhaps more direct measures of public attention versus proxy measures such as traditional print media and surveys (Ripberger 2011, Gupta and Jenkins-Smith 2015).

When the issue-attention cycle is applied in policy research it is often compared to or combined with another concept. It is suggested that policy scholars integrate the issue-attention cycle into larger theories of public perception or policy processes to gain theoretical traction (Gupta and Jenkins-Smith 2015). For example, Chamblin's dissertation (2016) combines the issue-attention cycle with the advocacy coalition framework to explore the Radiation Detection Equipment Program of the US. The combination of concepts allows for a more in-depth discussion of the role of actors. This research also paid special attention to the effects of budgetary constraints on policy attention and action in stage 3 of the cycle. Another dissertation explored the issue-attention cycle as well as Kingdon's concept of a policy window (Kimrey 2015). The goal of the research was to find if specific variables contribute to and accelerate attention to an issue post-crisis, as well as determine if attention compels public or political change in opinion. Kimrey also discussed the idea of the issue-attention cycle being able to both open and later close a policy window. This thesis continues the discussion linking the issue-attention cycle and Kingdon's theory of agenda setting. Similar to Kimrey's variables that contribute to an issue's attention, Soroka (2000) considered issue attributes, such as severity and proximity. Soroka's dissertation presented a comprehensive agenda-setting framework that went beyond just the public or policy agenda exclusively to include the dynamic relationships between the public, media, and policy agendas. The distinctions between these three agendas and the methods used to measure them are considered in this thesis.

2.1.2 Agenda Setting

There are several well-established theories of agenda setting, most relevant to the issue-attention cycle are the theories of punctuated equilibrium and multiple streams. Punctuated equilibrium was introduced by Baumgartner and Jones (1991) who suggest that policy remains relatively stable for extended periods of time and is punctuated by short periods of rapid change. In their case study of nuclear power, they examined problem expansion through which the inclusion of more policy actors, such as the public, along with increased negative media attention led to the destabilizing of a policy monopoly and subsequent rapid policy and institutional changes. Baumgartner and Jones (1991) also made the important observation that when a problem is portrayed as technical rather than social, it allows for experts to dominate the agenda.

The multiple streams theory offers an approach to agenda setting which seeks to capture the irregularity of the real world. The multiple streams approach was developed to explain the necessary conditions for policy change to occur. Kingdon's (2003) approach to agenda setting provides several concepts and distinctions which make this framework useful to the empirical study of policy formulation and change. Firstly, a distinction is made between the governmental agenda, when an issue enters the government discourse and attention, and the decision agenda, when an active decision is to be made on an issue existing on the governmental agenda. Yanovitzky (2002; discussed above) adopted this in his distinction of policy attention and policy action. In addition, an issue may rise onto the governmental agenda but never elevate to the decision agenda. An issue's inability to rise on the agenda can be due to many factors including lack of political will or no feasible policy alternatives. Kingdon clarifies "Conditions become defined as problems when we come to believe that we should do something about them" (Kingdon 2003, 109). The belief that a problem can be solved is critical, when this belief fades so does the attention to the problem.

Kingdon builds upon the Garbage Can Model of policy change first proposed by Cohen, March, and Olsen (1972) to develop a multiple streams approach to agenda setting. The distinct "streams" of problems, policies, and politics flow according to their own logic and causality. In Kingdon's view, it is only when the streams converge that opportunities arise to place new items on the policy agenda. The problems stream refers to the recognition of problems, that is by which mechanisms do problems gain attention. Indicators, focusing events, and feedback from policy evaluation are a few of the discussed mechanisms. Interest groups and the media play key roles

in the problems stream. The policy stream refers to the arena in which policy ideas and their corresponding alternatives circulate, that is proposed solutions and different approaches to the use of policy instruments. A policy idea may be brought forward by any actor, but it is bureaucrats and policy analysts who contribute the most to the forming of alternatives. The processes by which policy ideas develop and change is described as evolutionary, not resembling the rational model but rather changing and adapting to survive. A few core criteria of policy longevity include technical feasibility, value acceptability, and reflexivity to future constraints. Politics is narrowed in definition to electoral, partisan, or pressure group factors which motivate action (Kingdon 2003, 145), in other words, the political will to act. Thus, the political stream refers to the changing political forces which pressure political action. There is a balance in the political stream between the will of the politicians and that of the public. The ‘national mood’ or public opinion guides and constrains the action of decision-makers.

These streams run, for the most part, independently of one another. When there is a perturbation, or a change, in one of the streams an opportunity arises for an actor, the policy entrepreneur, to bring the streams to an intersection. The policy entrepreneur is referred to as the “advocate for proposals or for the prominence of an idea” (Kingdon 2003, 122). They are said to have a favourite solution which they continually try to attach to different problems. The policy entrepreneur often has some level of influence with the political executive and politicians who hold other positions of power, such as the Chairs of Congressional Committees in American government. Other research has discussed the influence that stakeholders with access to high level executives have on policy and found that their presence was often decisive to an issue entering the agenda (Engstrom et al. 2008). When an opportunity to bring the three streams into alignment appears, it is referred to as a policy window. Policy windows are “the opportunities for action on given initiatives” (Kingdon 2003, 166). Policy entrepreneurs that recognize the open window have the opportunity to couple the problem and policy streams by fitting their pet solution to the problem at hand. If time is wasted in the coupling process, or the open window is not recognized, the window may close. But, if a policy is pushed through, it can pave the way for a window in a similar area of policy to open. The three streams of problems, policy, and politics must flow together for at least a short time for agenda setting to lead to policy action.

Policy entrepreneurs are the critical agents of policy change. Kingdon’s policy entrepreneur has been further expanded upon by Mintrom and Norman (2009), emphasizing the

importance of contextual factors in shaping their effectiveness. Four distinguishing elements were introduced; social acuity, defining problems, building teams, and leading by example, and are suggested to be central to policy entrepreneurship. Social acuity refers to an actor's sensitivity to the policymaking context of an issue, suggesting they are attuned to watching for policy windows. Policy entrepreneurs that seek to promote an idea will play a role in how the problem is defined to ensure it fits with their idea. This may include presenting evidence to define the problem as a 'crisis at hand'. Building teams refers to the policy entrepreneur's ability to work with others. This includes with their own teams as well as their networks and not limited to the jurisdiction within which the problem sits. Lastly, policy entrepreneurs lead by example showing a "genuine commitment to improved social outcomes" (Mintrom and Norman 2009, 653). While many policymakers may avoid taking risks the policy entrepreneur will demonstrate the workability of their ideas. Through these four elements of policy entrepreneurship it is possible to couple streams and push ideas through an open policy window.

Other authors studied the role and efficiency of policy entrepreneurs in the Canadian context. Hopkins (2016) discussed how institutions and incentives encouraged or discouraged policy entrepreneurs and policy innovation. He assumed policy entrepreneurs are rational actors inferring that incentives would be effective in triggering policy innovation. He found this to be true in Canada where institutions with more incentives saw more policy innovation. Other research used Mintrom and Norman's 4 elements of policy entrepreneurship to discuss the success of initiatives (Macnaughton, Nelson, and Goering 2013).

Kingdon's approach to agenda setting illustrates not only the ways in which the agenda is set but also the ways in which policy action fails to be taken. Without the alignment of the streams, policies will fail to elevate to the decision agenda. Policy windows are short-lived and easily closed. The multiple streams approach and the concept of a policy window elucidates the many variables that affect policy change and allow for policy stability.

2.2 Theoretical Framework

This thesis uses Kingdon's approach to agenda setting, focusing on the means by which issues gain attention as well as policy windows and policy entrepreneurs. Indicators, policy feedback, and focusing events are the most recognized means by which issues gain attention. Indicators are the measuring and monitoring of various activities by government and non-

government alike, these include activities such as budgetary impacts, public transit ridership, or disease rates. Indicators are used in two ways, “to assess the magnitude of a problem and to become aware of changes in the problem” (Kingdon 2003, 91). As indicators are largely objective data such as rates, percentages, and statistics, it is a matter of interpretation as to whether they point to a policy problem or not. Policy feedback comes in many forms both formal and informal and includes the systematic evaluation of an enacted policy, unintended impacts of policy, and complaints. Issues gain attention when policy feedback indicates that the intended policy goals are not being met or are being met with unintended negative consequences. Focusing events are crises or disasters, personal experiences, or powerful symbols which capture the attention of the general public and policymakers. Other authors have recognized that this definition is post hoc, and in response have set out to define ‘potential focusing events’ with various features such as nearly simultaneous public and policymaker awareness (Birkland 1997). In either case, it is recognized that focusing events must be accompanied by firmer indications of a problem to rise onto the agenda, that could be a pre-existing perception or a cluster of similar events such as multiple airplane crashes. Focusing events can also open policy windows by creating a sense of urgency for action, to which policy entrepreneurs can put forward their solutions or even partial solutions if they fit the problem. Problems that are more visible are less likely to require a focusing event for governmental attention. Kingdon states “the more visible the policy domain, the less important are crisis and disaster” (2003, 94). Health policy, for example, gains public support as it affects daily life, for that reason a major crisis doesn’t need to occur for the policy to gain attention. Downs (1972) explores each of these mechanisms within the context of environmental issues. Many environmental issues gained attention as they deteriorated and became more visible, either through indicators such as air quality, or focusing events like oil spills. Secondly, Downs (1972) recognized what he called ‘soaring aspirations’, that is increasing standards and expectations of the public. This may be demonstrated through policy feedback, where previously acceptable policy is now seen as inadequate, unable to reach the rising standards and goals. The mechanisms by which issues gain attention are necessary to understanding the occurrence of an issue-attention cycle.

The policy window represents the opportunity for policy action. Most often windows open because of changes in the politics stream or recognition of a new problem in the problems stream. Recognition of a new problem or worsening of an existing problem is likely to draw

public attention and may begin an issue-attention cycle. By reacting to a change in the problems stream, the issue-attention cycle signals the opening of a policy window. Kimrey's (2015; discussed above) dissertation embraced this idea but did little to expand on it. In addition, the realisation of cost and de-escalation of attention to an issue in stages three and four of the cycle may correspond to the closing of a policy window. The issue-attention cycle may present a way to map the policy window, the opportune time of high public and policy attention that can allow for policy action. Figure 2.2 juxtaposes the multiple streams model next to the issue-attention cycle. As an issue enters stage two of the issue-attention cycle increasing public and government attention will elevate the issue onto the governmental agenda. A policy entrepreneur can advocate for their pet solution, taking advantage of the increased attention to the problem, and couple the problems and policies streams. As public attention rises to its peak, pressure on the government to do something will increase and the policy window will open. If the policy entrepreneur is successful in bringing the streams together and other factors such as budgetary constraints allow, policy action may be taken. The issue will have elevated to the decision agenda. But, if the policy entrepreneur doesn't act or fails to couple the streams, the government attention to the issue will decrease as the public's attention decreases and the policy window will close. The issue now enters stage five and may remain on the government agenda or with time it may slip off.

It is important to note that these events are not always going to happen in unison. It is possible to have an issue-attention cycle while the three streams continue to run independent of each other and no policy window opens. And the opposite is true as well, the streams may flow together, and a policy window may open without an issue-attention cycle. If the policy entrepreneur is not ready, for example there are no available policy options, the wave of public attention will pass by. On the contrary, the policy entrepreneur may be ready and find conditions are right to couple the streams and push for policy action without needing a wave of public attention. This may happen after an election when a change in the politics stream can open a policy window setting the right conditions for policy action. The work of the policy entrepreneur can influence how and if the issue-attention cycle and multiple streams approach interact.

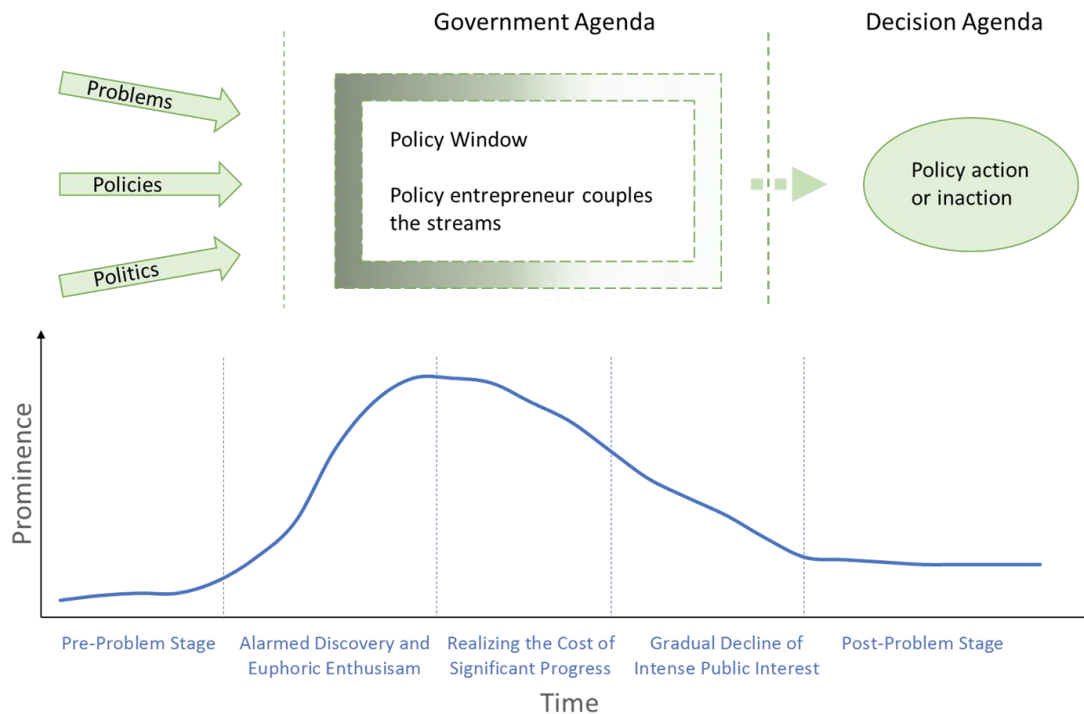


Figure 2.2. The multiple streams approach above the issue-attention cycle. Note: there is more than one outcome to the multiple streams approach, it does not necessarily end in the decision agenda.

2.2.1 Considerations for the Canadian Context

The issue-attention cycle was developed to describe the dynamics of American public attention. And, the multiple streams approach was conceived to capture agenda setting in the American presidential system. Accordingly, some considerations should be made when applying the conceptual framework to the Canadian context. First, Canada has a parliamentary system of government versus the U.S. presidential system. Howlett's (1997) application of the issue attention cycle found that while there was some evidence the cycle exists in the Canadian context, for some issues policy attention preceded public attention. He suggested that "the institutional structure of parliamentary regimes, which deliver extensive agenda-setting powers to governments by, among other things, curtailing public and media access to information" (1997, 27) were the cause of this inversed result. Canadian public attention is otherwise expected to behave as the issue attention cycle describes.

The multiple streams approach has been applied in the Canadian context, but divergences from the original approach are discussed as a result and not further theorised. For example, a study of the ban on flavoured tobacco products stated that non-governmental organisations (NGOs) play an important role in agenda setting in Canada but this claim is only substantiated by their own empirical evidence (Lencucha et al. 2018). They also note that NGOs often receive some funds from government. Harrison and Hoberg (1991) suggested that the institutional structures of the US and Canada provide different mechanisms for policy entrepreneurs to push an issue onto the agenda. Furthermore, Canadian political culture encourages party discipline, discouraging independent pursuit. In their case studies of environmental toxins they found it was not sufficient for officials to know about an issue, it was only when it was publicized that policy action occurred (Harrison and Hoberg 1991). This means policy entrepreneurs in Canada rely more heavily on public attention to an issue to elevate the issue on the agenda.

Research which has expanded agenda-setting theories or tries to merge existing theories has used the multiple streams approach as a starting point. From this research there has been some discussion of the Canadian context. Soroka discusses the media, public, and policy agenda separately in his dissertation (2000). In the discussion of policy measures he draws from Kingdon and discusses the similarities and differences between the Speech from the Throne and the State of the Union Address. In statements such as these “the content is more symbolic than substantive” (Hinckley 1990; referenced by Soroka 2000, 113) in regard to its significance for policy. Unfortunately, the Speech from the Throne is not conducted on a regular basis, making it an inconsistent measure. In their merging of the multiple streams approach with the policy cycle, Howlett, McConnell, Perl (2015) recognize the role of government in steering policy. More specifically they discuss how the processes of decision-making affects the multiple streams approach. They suggest a fourth processes stream which extends the multiple streams approach into the policy development stage. Suggesting how a change of government or the dynamics of a minority government can affect the ability of policy to move to later stages of the policy cycle.

2.3 Existing Studies of Radon

There is limited research which considers radon as a public issue or focuses on radon policies. A survey of national policies that address radon in both dwellings and workplaces found a diverse range of guidelines and policies have been implemented around the world (Colgan and

Gutierrez 1996). Most countries adopted the recommended international reference levels. The National Radon Program and radon research in Canada has been reported on by Chen et al. (2011 and 2015). The reports included topics such as radon potential mapping, radon testing, the launching of an environmental health campaign, radon building material testing and building envelope research, and more.

Research has assessed the implementation of radon guidelines and policies using economic theories and qualitative methods. A survey of residents in Maine, U.S. evaluated how risk perceptions are formed (Smith and Johnson 1988). Households first received information about the health risks of radon in the home and water supply. Smith and Johnson concluded that the information was used to revise risk perceptions (1988). This would suggest information campaigns are effective policy instruments, although the authors did note that developing an effective campaign is a difficult task.

Spiegel and Krewski (2002) assessed compliance of the historic Canadian radon guideline of 800 Bq/m³ by using willingness to pay. An initial survey discovered attitudes and knowledge of radon along with three other environmental health hazards. This was followed by an additional questionnaire where hypothetical exposure situations and mitigation costs were presented. They found willingness to pay varied directly with the level of radon, but it was unlikely that money for testing and mitigation would be spent even at levels well over the Canadian guideline. Another study explored sources of information and knowledge of radon risks as well as enablers and obstacles to testing and mitigation of radon (Khan and Chreim 2019). Through interviews they found that participants who were most likely to take action on radon showed a clear understanding of the health risks and often had concerns for family members' health. Obstacles to testing and mitigation identified were a lack of awareness about radon risks and costs.

Finally, risk perception of radon has been explored from a psychological perspective including the cognitive, emotional, and social elements of risk perception (Hevey 2017). Radon is a colourless, odourless, tasteless gas. This lack of physical cue and the delayed effect of long-term exposure allow the risk of radon to be downplayed. In the social context if others do not see radon as a threat it is likely those close to them will not either. Lastly, risk communication about radon can trigger a defensive response to the information dependent on how personally

significant the message is. Hevey (2017) summarizes the challenges risk communicators and policy makers face when addressing the risk of radon.

2.3.1 The Radon Narrative in Canada

Radon became a public concern in 1975 when elevated levels were discovered in several homes and public schools in the town of Port Hope, Ontario (Tracy et al. 2006). The need for a Cross-Canada dataset to identify elevated radon levels from natural or man-made sources in other geographic regions was soon realised. Nineteen Canadian cities and a total of 14,000 homes were surveyed in 1977, 1978, and 1980 (Letourneau et al. 1984). Links between radon and lung cancer have long been studied in miners, and with supporting epidemiology studies and animal and cellular research, radon was classified as a known carcinogen in 1988 by the International Agency for Research on Cancer (IARC; IARC 1988). In the same year Health Canada established the first radon guideline reference level of 800Bq/m³ for the public (Dunn and Cooper 2014). The National Radon Guideline was established as voluntary and the responsibility for testing and remediation is that of the homeowner.

In the decade between the cross-Canada survey and the first radon guideline, some provinces began their own radon initiatives. Saskatchewan and Manitoba conducted further surveys and issued information pamphlets adopting the newly established radon guideline (Harrison and Hoberg 1991). Research continued to examine the health effects of radon and effectiveness of mitigation practices. In 1995 Health Canada's proposal to lower the guideline to 400Bq/m³ was not successful and concerns about lung cancer risks continued to mount (Tracy et al. 2006). In 2004 Health Canada held a 2-day workshop with stakeholders and experts "to examine the latest scientific evidence and to discuss policy issues associated with radon" (Tracy et al. 2006, 737). This workshop revealed the lagging status of Canada's radon policy behind the international community and highlighted concerns which needed further research.

In the following years many changes would be made to acquire new data, set new standards, and work with the industry to ensure the public was getting relevant information from credible sources. In 2007 the radon guideline reference level was lowered from 800Bq/m³ to 200Bq/m³ and incorporated into the National Building Code (NBC; Dunn and Cooper 2014). The National Radon Program was initiated by Health Canada in conjunction with the provinces and territories in 2008. This program included the launching of a Cross-Canada survey of 14,000

homes conducted from 2009-2010, as well as the testing of nearly 13,000 federal workplaces for radon from 2007 to 2013. This data updated the then 25-year-old survey results, and further added to the data of geographic regions with elevated radon levels.

Public education campaigns have also been used by federal, provincial, and territorial governments, and November 2013 marked the first annual Radon Action Month. Radon Action Month is an initiative that all levels of government and other stakeholders take part in to raise radon awareness, encourage the testing of homes, and provide resources to the public. To ensure credible sources of information and trusted professionals were available for the public, the Canadian National Radon Proficiency Program (C-NRPP) was established in 2014, providing training and certification of radon mitigation specialists (Quastel et al. 2018). Current concerns of the radon industry include energy efficiency programs and retrofits, as radon levels can increase when homes are made more airtight. The National Radon Guideline has been established and incorporated into the NBC (2010) as well as the Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM) however to become law these guidelines must be adopted by provincial/territorial governments. Compliance remains voluntary.

Chapter 3. Methods and Hypotheses

3.1 Study Overview and Hypotheses

This research seeks to capture the influence of public and media attention on policy attention and subsequent policy action. First heightened periods of public and media attention are identified, then the relationships between public, media, and policy attention are considered. Subsequent policy action or inaction is examined using the multiple streams approach where the concepts of an open policy window and a policy entrepreneur are crucial.

The conceptual framework recognizes that the interactions between the public, media, and policy are multi-directional. The framework is summarized in Figure 3.1. External factors effect all of the variables and can therefore enhance or impede interactions. Public, media, and policy attention are identified as separate variables interacting in a manner consistent with Soroka's expanded agenda-setting process (2000, *Figure 1.A*). A further mediating variable, the policy entrepreneur, is introduced connecting policy attention to policy action. Media and public attention are shown to effect policy attention. Policy attention then may translate to policy action.

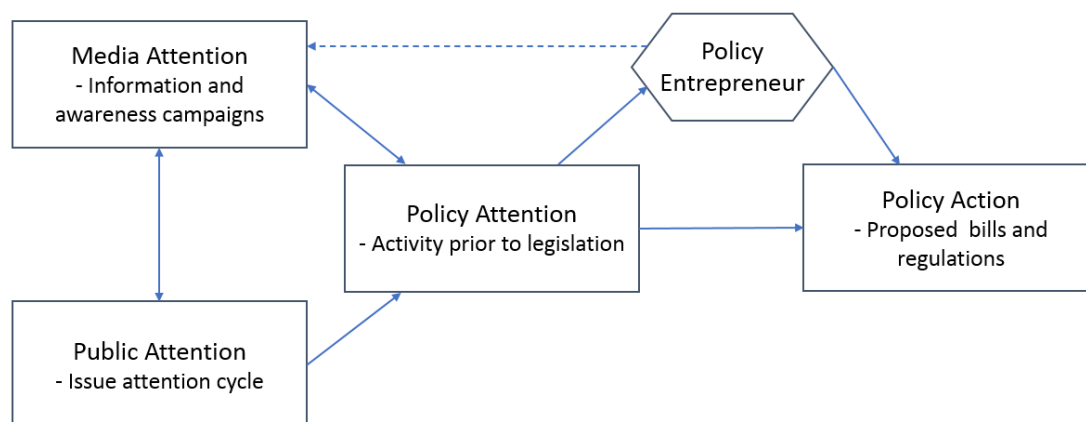


Figure 3.1. The conceptual framework.

Again external factors can influence how policy attention translates to action. The policy entrepreneur plays a role in fitting a solution to the problem and pushing it to policy action, through an open policy window. A dotted arrow has been drawn back from the policy entrepreneur to media attention. This arrow proposes that the policy entrepreneur can interact with the media to raise attention to a problem and policy idea. This connection creates a

feedback which can increase public, media, and policy attention and has the potential to open a policy window.

This thesis applies the issue-attention cycle to radon in Canada through a longitudinal study. Within-case analysis explores the influence of public and media attention on policy attention. A longitudinal case study measured the intensity of attention to radon over a period of time. As this research seeks to capture the process of agenda setting and the subsequent policy change the selected time period should be substantial enough to capture this process. For example, Kingdon (2003) conducted research and interviews over four years. Initial scoping included data from 1970 till the present, but the study focuses on a smaller but more distinct window from 2007-2019. As online sources have only gained prominence within the last few decades, there is a discontinuity in the available data. It is expected that the increased access to information on the internet will increase the intensity of public attention. Measures of public and media attention include internet search trends and traditional media databases. Policy attention was measured using the House of Commons index Hansard as well as the Alberta legislative Hansard and other online databases. In addition, a multi-methods approach was used to capture time-series data, while semi-structured interviews provided insight into the undocumented activities of government.

The following hypotheses are addressed:

1. The issue-attention cycle is predicted to exist in the context of radon.
 - There will be discernible peaks in public attention to radon, that rise rapidly and slowly decrease.
2. The issue-attention cycle influences policy attention and action.
 - Following a peak in public attention there will be an increase in policy attention and subsequent policy action.
 - An increase in policy attention may be partially created by the policy entrepreneur working to open a policy window.

These hypotheses seek to apply the concept of the issue-attention cycle and explore its role in agenda setting. To date the issue-attention cycle has yielded mixed results in its applicability to the Canadian context. In addition, many studies have found evidence that a link may exist between the issue-attention cycle and policy action, but mechanisms remain largely unexplored within the agenda setting literature.

3.1.1 The Issue Attributes of Radon

There are three issue attributes that are suggested to make issues susceptible to the issue-attention cycle and may also influence the way that problems behave during the cycle. First, an issue which adversely affects a small group of the population is likely to experience the issue-attention cycle, as the problem can exist mostly unnoticed until some event brings it to the attention of the public. Radon can go largely unnoticed because testing is required to determine the level of exposure. However, it has been established that radon is the second leading cause of lung cancer in Canada, and this indicator should trigger a rise in public attention. Secondly, typically the issue comes about through an arrangement which benefits the majority or a powerful minority. To describe this attribute Downs uses the example of car ownership and “the prohibition of using motor-fuel tax revenues for financing public transportation systems” (1972, 41). In this example, there is an arrangement which concentrates benefits and diffuses costs. In the case of radon, action that aims to reduce radon levels has diffuse benefits, lowering lung cancer rates, and concentrated costs that fall on the homeowner. This may be the reason why the majority may want to ignore or downplay the seriousness of the risk. Conversely, builders and realtors may want to ignore the problem to ensure all homes are sellable, additionally landlords may want to ignore the problem to ensure all units are rentable. Lastly, there is the question of the extent to which an issue can continue to attract public attention because of its intrinsic newsworthiness, perception of risk or entertainment value. Radon is a naturally occurring gas, sometimes referred to as an environmental pollutant. Previous risk perception research has found naturally occurring risks are perceived as less of a threat than technological risks (Hevey 2017 and others). This would suggest radon is a boring subject matter to report on. Additionally, radon has no physical cues that would alert someone and the danger is in fact due to long-term exposure. Therefore, the public is likely to ignore or lose interest in the issue of radon exposure. These issue attributes make radon more likely to experience the issue-attention cycle but are not necessary conditions (Downs 1972).

3.2 Attention and Action - Definitions and Measures

Research that has applied the issue-attention cycle has not been systematic in the way concepts are defined and measured (as seen in the discussion of the previous chapter). For the purpose of this research definitions of attention and action will be drawn from Kingdon (2003)

and further clarified by other authors. Public attention refers to the time and other resources people willingly devote to an issue (Newig 2004). Time is a scarce resource and accordingly so is public attention. For this reason, social issues and other subjects compete for public attention, and can cause public attention to change rapidly. Public perception, on the other hand, “relates to individual value judgments and/or predispositions” (Ripberger 2011, 240). By nature, public perceptions are slow to change as they are learned behaviours. Perceptions do not require much in terms of people’s resources as once formed there is no need to dedicate anymore time to them (Newig 2004). In the literature, policy attention is sometimes referred to as the ad hoc activities of government. Yanovitzky (2002) defines policy attention as the cognitive elements. In practice this means policy attention refers to any activity prior to direct policy action addressing the issue, including debates, interviews, and research. Policy action refers to the behavioural elements (Yanovitzky 2002), such as proposed bills and legislative changes. Policy action is the decision to take, or omit, direct action to address the issue. These definitions of policy attention and action are parallel to Kingdon’s (2003) distinction between the governmental agenda and the decision agenda, respectively.

The following section explains how attention and action are measured using these definitions. This begins with a discussion of how public attention has been measured in previous research and how internet data is utilised. Second, this section explains how conventional media attention was captured. Lastly, the measures of policy attention and action are explained. Policy was captured at the federal, provincial, and municipal levels, each is discussed below.

3.2.1 Measurement of Public Attention

Previous research has measured public attention using surveys and polls, or by proxy of media attention. These measures have certain trade-offs as capturing the true public attention requires the continuous measure and transparency of thought processes (Ripberger 2011, Gupta and Jenkins-Smith 2015). Public attention is by nature dynamic. In order to mitigate the trade-offs and capture the dynamic nature of public attention new methods emerged. The prominent use of the internet to share information presents the most obvious new measure of public attention. Internet data can be classified into two types, supply-based internet data, or what is published, and demand-based internet data, or what is sought by users (Eysenbach 2009).

Epidemiology was first to use search engine trends to inform public health and policy (Eysenbach 2017). Search trends are a dynamic form of demand-based internet data and can be used as a measure of public attention as search behaviour aligns with the definition. “After all, if a citizen is willing to invest scarce time and energy into searching the Web for information about a public issue, it can be safely assumed that he or she is interested in and attentive to that public issue” (Ripberger 2011, 243). But, the allure of this Big Data doesn’t come without limitations as Lazer et al (2014) discuss. Search engines, such as Google, are for profit companies not specifically designed research instruments, meaning the data they produce is not necessarily valid, reliable, or replicable. Discretion must be used when integrating this data into research.

This thesis uses Google search trends to measure public attention, gathering data from the Google Trends publicly accessible website (trends.google.com). The search engine Google was chosen due to its prominence in use and the readily accessible data which can be downloaded in comma separated value (CSV) format for further analysis (Ripberger 2011). Data is available from 2004 till the present on the Google Trends publicly accessible website. There are various filters built into the application to refine results including location, time period, category (to refine results of words with multiple meanings), and type of search (web, news, image, shopping, or YouTube). The search term ‘radon’ was used to assemble the data, and refined to Canada as the location, a time period of 01/01/2007 till 12/31/2019, all categories, and web searches.

This application provides data on a scale that is proportional to all searches and will provide a zero if the results are below the privacy threshold. These zeros can be an issue for analysis, falsely lowering the average, but can be addressed. The Google Trends data set displays internet searches as a proportion of peak interest or popularity over time. The month of peak interest is scaled to 100 and all other months shown as a portion of the peak. For example, if a month had half as many searches as the peak month it would be displayed on the graph to have a value of 50.

Health Canada, the federal institution responsible for maintaining and improving the health of Canadians as well as reducing health risks, supplied additional data upon request. Health Canada provided yearly data on public outreach activities that included brochures, outreach events, public inquiries, and webpage views. The demand-based data, public inquiries and webpage views, were incorporated into this thesis as they align with the other sources in contributing to the measure of public attention. Over time Health Canada has updated and

revised their webpages on radon, so the measure of webpage views includes pages like *Healthy Canadians Radon* and *Take Action on Radon*. The quantities supplied are approximations on the best available data and are coarser in scale (yearly not monthly) than other data collected by the author. It shall be noted that Health Canada recommends visiting the *Take Action on Radon* webpage for testing and mitigation resources.

3.2.2 Measurement of Media Attention

Media is often used as a proxy measure of public attention. However, this research recognizes Soroka's (2000) approach to agenda setting theory in which there are feedbacks between the media and public as well as the media and government. This thesis examines major media outlets and newsprint to establish the intensity of media attention over time. The intensity of media is a count of the number of articles, videos, and radio audio clips per unit of time. Other research measured number of mentions of keywords (Howlett 1997) or number of articles (Baumgartner and Jones 1993 and Soroka 2000) and used different search techniques such as keyword in title searches. As this research seeks to capture attention, it is enough to count each article which mentions radon as it is subjective to assume an article which mentions radon 5 times brings more attention than an article which mentions radon once. It is typical of previous research to include at least 3 major newspapers and for them to undergo content analysis. Instead a different approach which harnessed the advantages of newspaper archives being available online was adopted and allowed for the incorporation of data from major news outlet's online databases. A review of all English language Canadian newspapers on the Factiva database was conducted. This database is a worldwide news and information service and has been used for review of media in similar research.

An initial scoping search used media attention to map out attention to radon. The initial scoping time frame of 1970 till 2020 was selected as this precedes major nuclear power plant incidents and the discovery of radiation contamination in Port Hope, ON that occurred in 1975 (Rabe et al. 1994). A Factiva search of radon in Canadian newspapers yielded 1851 results, 1798 results were included. Articles were excluded which mentioned radon in an ad or as the name of a person or company. All other articles mentioning radon were included.

Media attention search results were narrowed to a window from the beginning of 2007 till the end of 2019. To attain a complete dataset only newspapers with archived coverage for the

complete window of time were kept in the dataset. A total of 16 newspapers met these criteria and are summarized in Table 3.1. Community, regional, and national media sources were each included, capturing various media perspectives and ranges of circulation.

To capture other forms of Canadian media the Canadian Broadcast Corporation (CBC) and CTV News were also searched for radon attention. The database of CBC includes online articles, radio, and video coverage and CTV News includes online articles and videos. These are available on each respective website from 2007 till the present.

Newspaper	Coverage
The Globe and Mail	national
National Post	national
The Hamilton Spectator (Ontario)	regional
Toronto Star	regional
Winnipeg Free Press	regional
Ottawa Citizen	regional
Edmonton Journal	regional
Guelph Mercury	community
Calgary Herald	regional
Montreal Gazette	regional
The Cambridge Reporter	community
Vancouver Sun	regional
Waterloo Region Record	regional
Airdrie Echo	community
Banff Crag & Canyon	community
Barrie Examiner	community

Table 3.1. Newspapers included in the dataset from 2007 till 2020.

3.2.3 Measurement of Policy Attention - Documents

Policy attention was measured through recorded government documents and supplemented by semi-structured interviews with stakeholders. Interviews are intended to measure the ad hoc activities of government that are less likely to be in recorded documents. The interviews also add perspective and clarity to the analysis and discussion.

Radioactive materials are regulated by the federal government, however naturally occurring radioactive materials, such as radon, involve shared jurisdiction. This includes guidelines set by the federal government, adoption at the provincial level, and implementation by municipalities. The multi-jurisdictional nature of this issue complicates the measuring of policy attention. For this reason, to measure policy attention representative cases from each level of government were selected. Provincial and municipal policy attention is measured via Alberta and Calgary. The House of Commons is ideal for representing the federal government's attention. Debates and other recorded documents such as Standing Committee evidence and regulations are considered. Soroka (2000) suggests the question period in the House of Commons supplies a good measure of policy attention but should be supplemented. Data was accessed through the online House of Commons debates archive, Hansard, as well as the Canada Gazette.

Alberta and Calgary were selected as representative cases to extend the within-case evidence, as well as for the logistical convenience and accessibility of evidence. Alberta has accepted national regulation and has initiatives in place to further radon awareness and assess policy implementation. Provincial legislative assembly documents, accessed through Alberta's Hansard, and regulations, accessed through the Alberta Gazette, were assessed parallel to the federal documents.

It is predicted that attention at the municipal level will follow attention at the federal and provincial levels due to lack of resources. Municipal policy attention was measured via accessible documents such as city council meeting agendas and reports. This data varied from provincial and federal policy attention and was analysed separately. Nevertheless, attentiveness to local levels of government is needed especially when considering interactions such as public hearings or submissions. Policy actors at a public hearing may include local levels of government as well as provincial and federal agents, they each may represent varying interests. For this reason, policy actors may not be treated as a homogenous actor within such contexts.

The House of Commons Hansard database performs a full text search of the documents. A search of the term radon yielded 15 debates, 176 committees, and 0 journal results in the federal database from the first sitting of the 37th Parliament, January 29th, 2001, till the present. These results were refined to count only the first mention of radon by each member of parliament or guest speaker. Filtering in this way removed the false inflation of results from presentations and extensive back and forth discussions. This process is also comparable to how newspaper articles and other media sources were counted. The Alberta Legislative Assembly Hansard, similarly, does a full text search and results were refined in the same way as federal search results. Alberta yielded 9 debates where radon was discussed and no journal or committee results.

The Canada Gazette and Alberta Gazette were searched for regulations pertaining to radon. When using the Canada Gazette search bar, a full text search is conducted. The Canada Gazette yielded 30 results, however only 2 results were relevant. All other results were excluded as they were out of context or related to the nuclear industry where radon is produced as a result of human intervention and sees different policy and regulations. The Alberta Gazette does not have a search function. Consequently, individual documents were searched for mentions of radon. The Alberta Gazette did not yield any relevant results.

Municipal attention to radon was not as easily measured as provincial and federal. Municipal governments do not have the same mechanisms and records of decision making. Additionally, municipal governments more closely interact with the public they serve. For these reasons and because of accessibility public submissions were included in the measurement of municipal attention. The City of Calgary has city council and committee meetings and bylaws of varying completeness from 1884 till the present available in an online database. Public submissions and city council meeting agendas including reports were retrieved from the City of Calgary database.

In addition to the national guidelines there are also international organisations which set radon guidelines. In 2004, Health Canada held a workshop to discuss the current state of radon policies and research (Tracy et al. 2006). Most of the international community had a radon guideline lower than Canada's radon guideline of 800Bq/m³ at that time. For example, the International Commission on Radiological Protection (ICRP) established a suggested "action level" range of 200-600 Bq/m³ more than ten years before in 1993 (ICRP 1993). This was later

updated in 2010 to a range of 200-300 Bq/m³ (ICRP 2010). In the context of radon, the influence of the international agenda on the Canadian agenda can be characterised by the lag of policy development and implementation. No further measure and analysis of the international agenda was conducted for this reason.

3.2.4 Measurement of Policy Attention - Interviews

Policy attention refers to the activity of government prior to direct action addressing an issue. Not all government activity is documented. Further insight into the workings of government and stakeholders was uncovered through interviews. Semi-structured interviews allow for a more natural discussion with open ended questions to steer the conversation and gain clarity. Discussions were focused on activity during times of increased attention, but also asked what was missing from the written record.

A total of 6 interviews were conducted (Appendix B). Participants were identified in two different ways, first by use of government directories and second from the initial scoping search of media. Media coverage on radon includes interviews with stakeholders and references to resources such as the *Take Action on Radon* webpage (takeactiononradon.ca). Those participants who were contacted first were encouraged to forward the invitation for interview to others relevant to the research. Participants were supplied with a brief description of the research as well as interview questions and a figure to stimulate the conversation (Appendix A). Interviews took place by phone and Zoom video communications and were audio recorded. Due to the current ongoing pandemic and the flexibility that phone interviews offer this was the best logistical option. Interviews were transcribed by the researcher. The insights from the interviews were incorporated into the research in 2 ways. First, the interviews added to the time-series of events and activities of government. Second, the interviews added context to the discussion of radon policy in Canada.

3.2.5 Measurement of Policy Action

Policy action was assessed by way of identifying all proposed and/or passed bills. This approach is similar to what is seen in the literature (Yanovitzky 2002) and accounts for the fact that policy change is dependent upon many variables beyond the attention which the issue receives. Regulations were also considered in the measure of policy action. However, no relevant

results were found in the selected time period. Policy action is discussed in relation to media, public, and policy attention.

Although this measure of policy action may be considered narrow in relation to other research (for example Peters and Hogwood 1985), it creates a strong test of the issue-attention cycle. Downs (1972) suggested that issues which are affected by the issue-attention cycle often go largely unresolved. New institutions, programs, and policies may result from an issue-attention cycle; however, their function likely contributes more to the new level of attention sustained in the post-problem stage than to the resolution of the issue itself. By defining policy action as the direct action by government to address the issue, it creates a more direct measure of the influence of policy attention on policy action. This definition also eliminates the measuring of actions by external organizations, which could be convoluted and lack generalizability by the selected representative cases.

3.3 Analysis

Although multiple periods of heightened public attention were identified two peaks were focused on for analysis. The first is a period of heightened attention in 2014 corresponding with the highest intensity of public attention to radon across Canada. The second is in 2017 corresponding with the highest intensity of public attention to radon in Alberta. These peaks in attention were selected based on the intensity and the relevance of the issue to the case selection context. The selected periods were matched against the predicted five stages of the issue-attention cycle, from the rapid rise in attention to the slow decline. And further discussed within the context of the three issue attributes that make an issue susceptible to the issue attention cycle. Aligning the data to the 5 stages tests for the existence of the issue-attention cycle in the context of radon, answering the first hypothesis. Indicators, policy feedback, and focusing events, are examples of drivers that are discussed as they push issues to gain attention and move from stage 1 to 2 of the cycle. Indicators may include lung cancer rates and occupational exposure studies. Policy feedback may include public health information campaigns and evaluations. Focusing events refers to crises or disasters, personal experiences, or powerful symbols which capture the attention of the general public and policymakers.

Policy attention is expected to lag public attention, and the period of lag time is expected to be context dependent (Howlett 1998, Birkland 1997). Qualitative data from the interviews was

used to support the time-series data and provide further insight into government activity around the peaks in public and media attention. The interview discussions are used to assess how the issue-attention cycle influences policy attention and action confirming the second hypothesis. Interviews also further explored the policy issue of radon identifying accomplishments and challenges in addressing the issue.

Next, the discussion examines if the issue attention cycle coincides with a policy window as the conceptual framework suggests. The issue attention cycle explains the dynamics of public attention and suggests there will be a rise in policy attention but not necessarily policy action. As public attention fades so does the policy attention and opportunity for policy action closing the policy window. By integrating the multiple streams approach agency is introduced to the issue attention cycle through the policy entrepreneur. The policy entrepreneur is critical to the opening of a policy window by coupling the two of the three streams, problems, politics, and policy. This suggests the policy entrepreneur may affect the issue attention cycle.

Possible policy entrepreneurs are identified based on the available data and assessed by the qualities defining them in the literature. Kingdon and other authors (2003; Mintrom and Norman 2009) described policy entrepreneurs as having distinguishing qualities such as persistence and their ability to build teams. These qualities and the specific strategies employed to further radon awareness are discussed.

The potential of an open policy window and the implications are examined in the following section. The coming together of the three streams policy, politics, and problems allows for the opening of a policy window. The three streams are described around the peaks of attention in 2014 and 2017. The role of the policy entrepreneur in coupling the streams and pushing a policy idea through the open window is assessed. The last of the analysis focuses on the factors which open and close the radon policy window. Identifying successes and failures in raising radon awareness and reducing the risk of radon.

Chapter 4. Observations

4.1 Media Attention

Media attention to radon was measured by newspaper coverage as found in the Factiva database and from 2 major Canadian news outlets CBC and CTV News. The Factiva database was used as a part of the initial scoping search, and newspaper articles mentioning radon from 1970 till 2020 were collected. Radon saw fairly low but constant coverage in newspapers prior to 2010. In 2011 coverage began to trend upward, peaking in 2014 and 2015 before declining again but remaining at an interest level that is about 5 times that of the 2000-2010 period. However, the number of archived newspapers held in the Factiva database was found to significantly

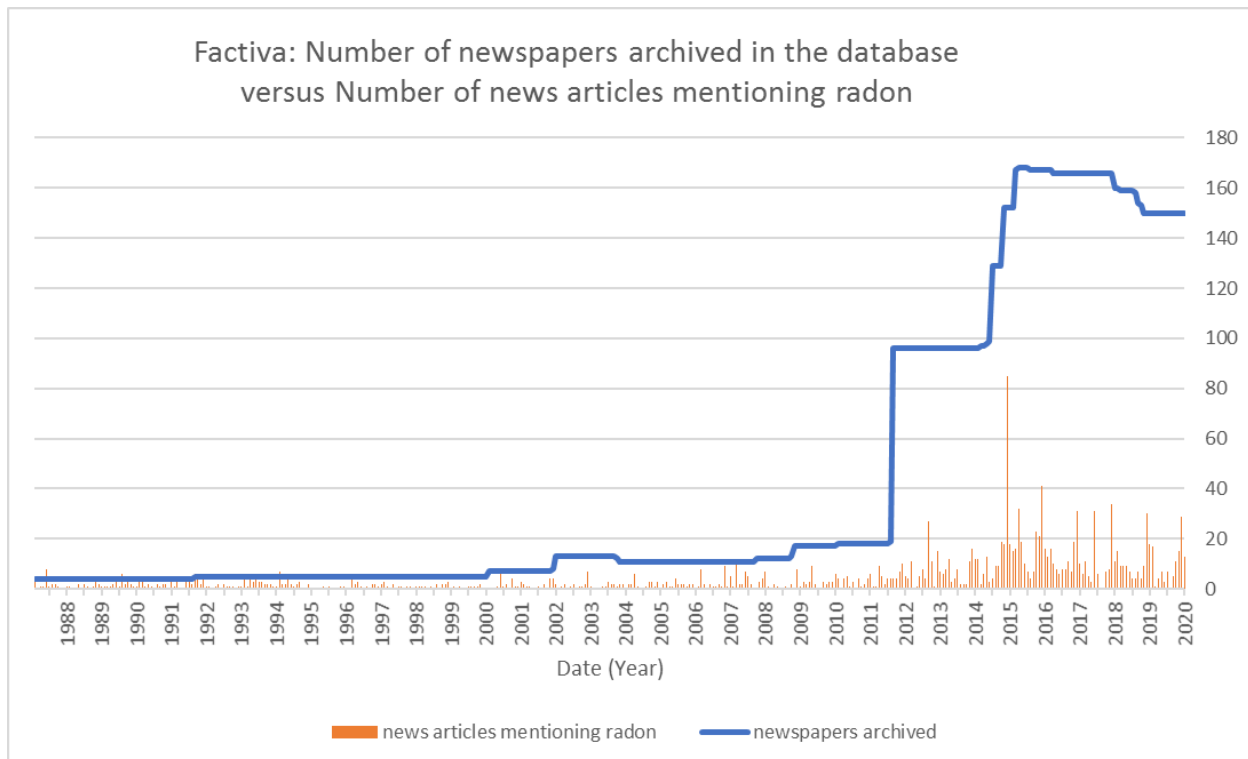


Figure 4.1. Factiva database search results and archival volume over time.

increase over time. As the number of newspapers archived in the Factiva database increased and the frequency of news articles mentioning radon also increased (Figure 4.1). This is an expected result and may be attributed to two observations. First, Canadian media has become highly concentrated since the early 2000s. According to News Media Canada, 44% of Canadian daily newspapers are currently owned by one corporation (2020a). In addition, 46% of community newspapers are owned by ten major corporations (News Media Canada 2020b). The

concentration of ownership means often a single story is repeated, appearing in multiple newspapers or within one newspaper on multiple dates. Second, as the internet has become more prominent and accessible, newspapers have moved away from traditional print to online publishing. The internet has made archiving more efficient and feasible for even small community newspapers.

A subset of the newspaper data was taken to allow for comparability with the other sources of media data, and to ensure a complete dataset. The subset of Factiva data includes 16 newspapers (Table 3.1). From 2007 till the end of 2019 there is an overall downward trend (Figure 4.2). Coverage peaks in 2014 and 2015 before declining again.

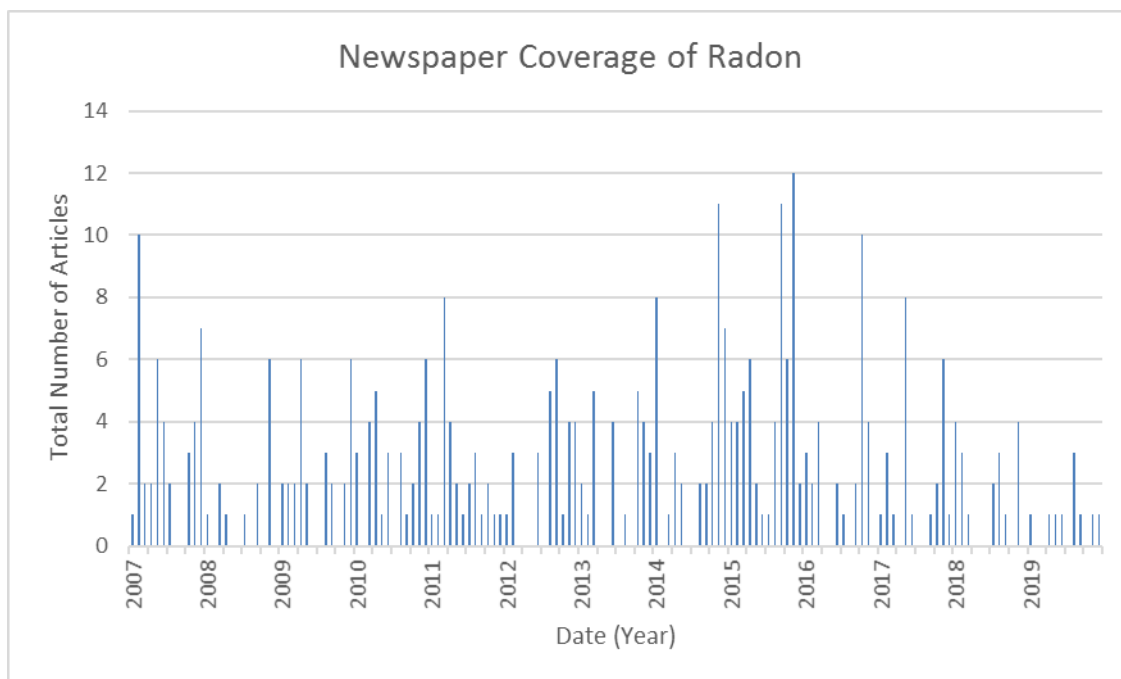


Figure 4.2. Subset of newspaper data collected from the Factiva database.

CBC coverage has a distinct peak in June 2014 (Figure 4.3). This peak seemingly splits the coverage into 2 periods, prior to June 2014 where coverage is irregular and after 2014 when coverage is much denser, or regular. In June of 2014 CBC released an interactive radon risk potential map based on data obtained from Health Canada. Multiple articles were prompted from this interactive map within the same month of June. Typically, these articles focused on local areas that were understood to have an increased radon risk potential.

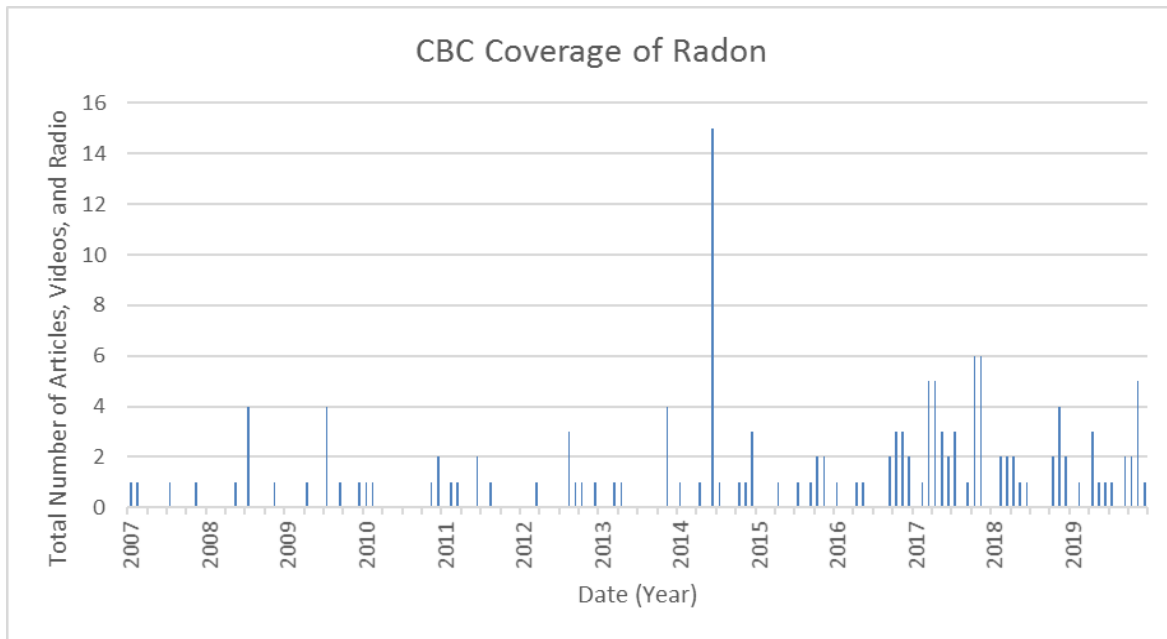


Figure 4.3. CBC coverage of radon over time.

CTV News coverage of radon increases over time but doesn't have an obvious pattern (Figure 4.4). Coverage does spike almost every November from 2013 onwards, with the highest coverage occurring in November 2017. CTV News released 16 articles focused on radon

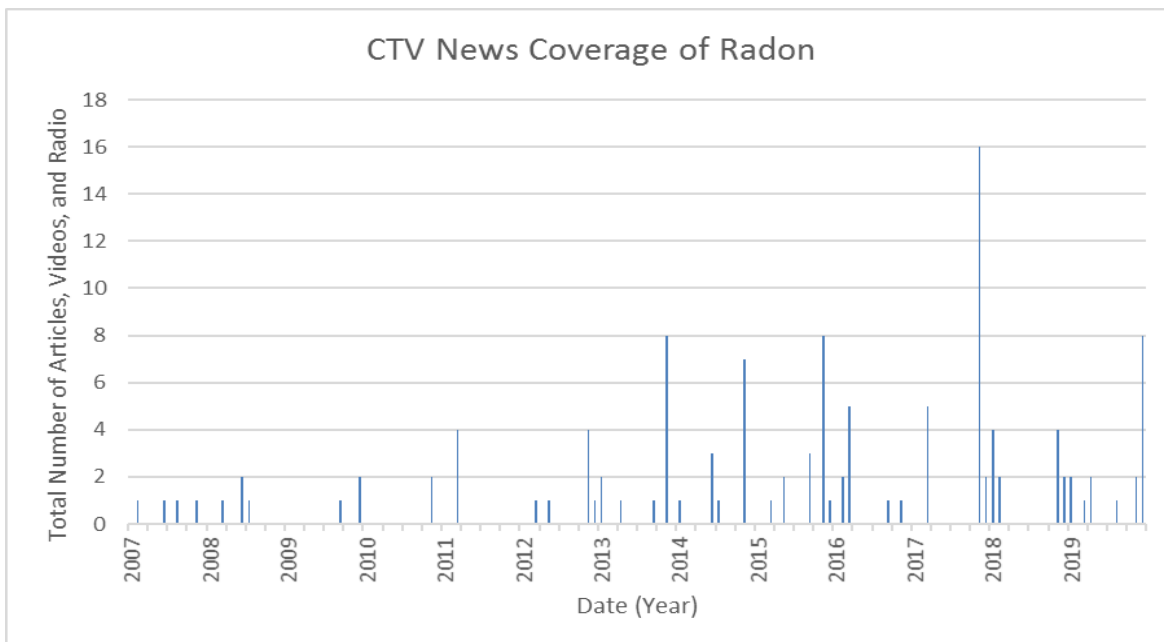


Figure 4.4. CTV News coverage of radon over time.

awareness and recent research findings on radon testing and mitigation in the month of November 2017.

4.2 Public Attention

Public attention to radon is represented by Google Trends internet search data. This data is scaled to the month of peak interest and all other months are a portion of the peak popularity. Peak interest of radon occurred in June 2014 (Figure 4.5). Interest spiked again to half or just over half as popular as the peak in November of 2015, 2017, and 2018. From 2004 till 2013 the search interest maintained a nearly constant average, and from 2013 onward there is slight upward trend.

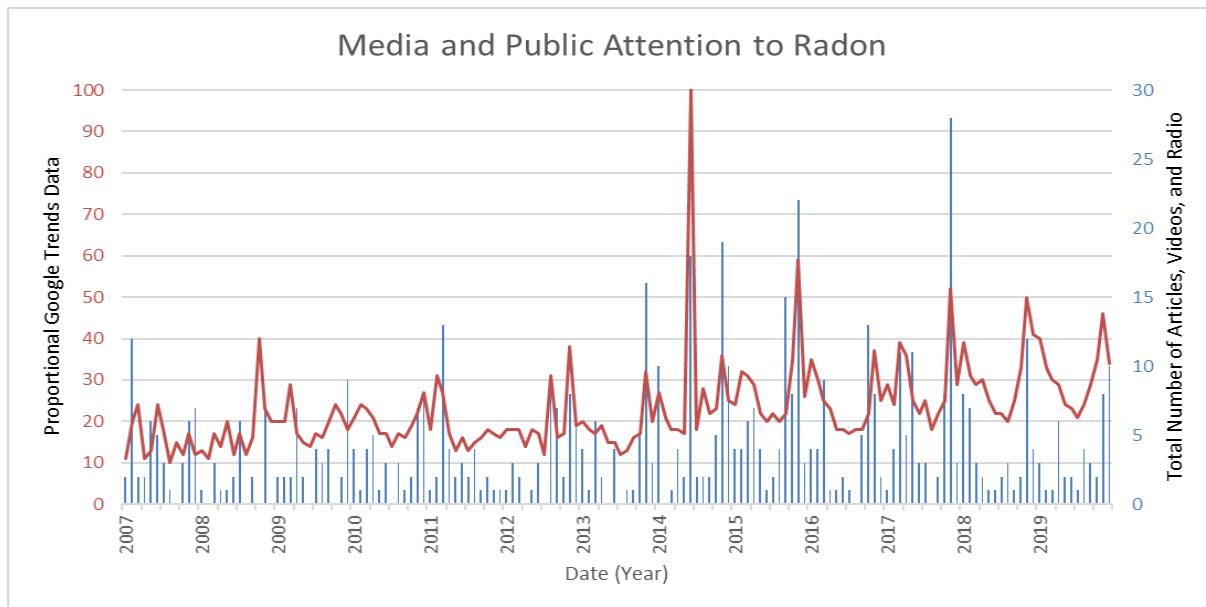


Figure 4.5. Google Trends data (red) and summed media data from newspapers, CBC, and CTV (blue).

Figure 4.5 plots the summed sources of media and the Google Search Trends data on top of each other and shows an alignment of media and public attention. Most notable is the alignment of media attention with public attention in June 2014. The spike in media attention is attributed to coverage by CBC. Each November from 2013 till present has a peak in media attention and a corresponding peak in public attention. This aligns with the establishment of radon action month. Prior to 2013 there is no obvious link between media and public attention. This figure displays an increase in regular periods of intense media coverage over time. Overall, both media and public attention trend upward.

Data on public inquiries and webpage views supplied by Health Canada shows an overall increase in public attention to radon (Figure 4.6). Public inquiries peaked in 2015/16 and webpage views in 2017/18.

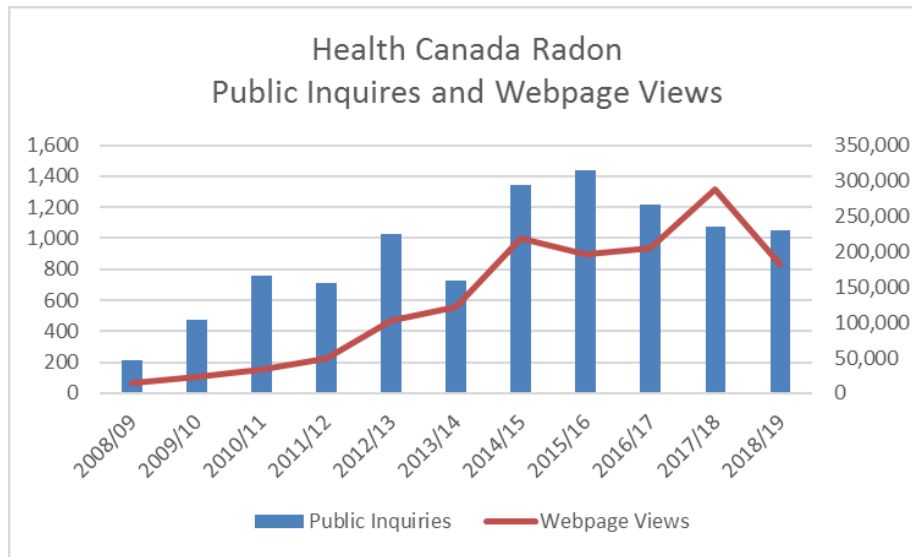


Figure 4.6. Data supplied by Health Canada. Note the data is coarser, representing each fiscal year.

4.3 Policy Attention

Policy attention was measured at the federal, provincial, and municipal levels. The House of Commons had the most regular attention to radon (Figure 4.7). In June of 2015 a panel of presentations on the various risks of radon was presented to the Standing Committee on Health. These presentations were given by interest groups like the Canadian Environmental Law Association (CELA) and government representatives from various agencies such as Health Canada's Radiation Protection Bureau or B.C.'s Centre for Disease Control.

The Provincial attention to radon is nearly non-existent in documentation, besides November and December of 2017 (Figure 4.7). During these months Bill 209 - *Radon Awareness and Testing Act* was introduced and read in the legislative assembly of Alberta.

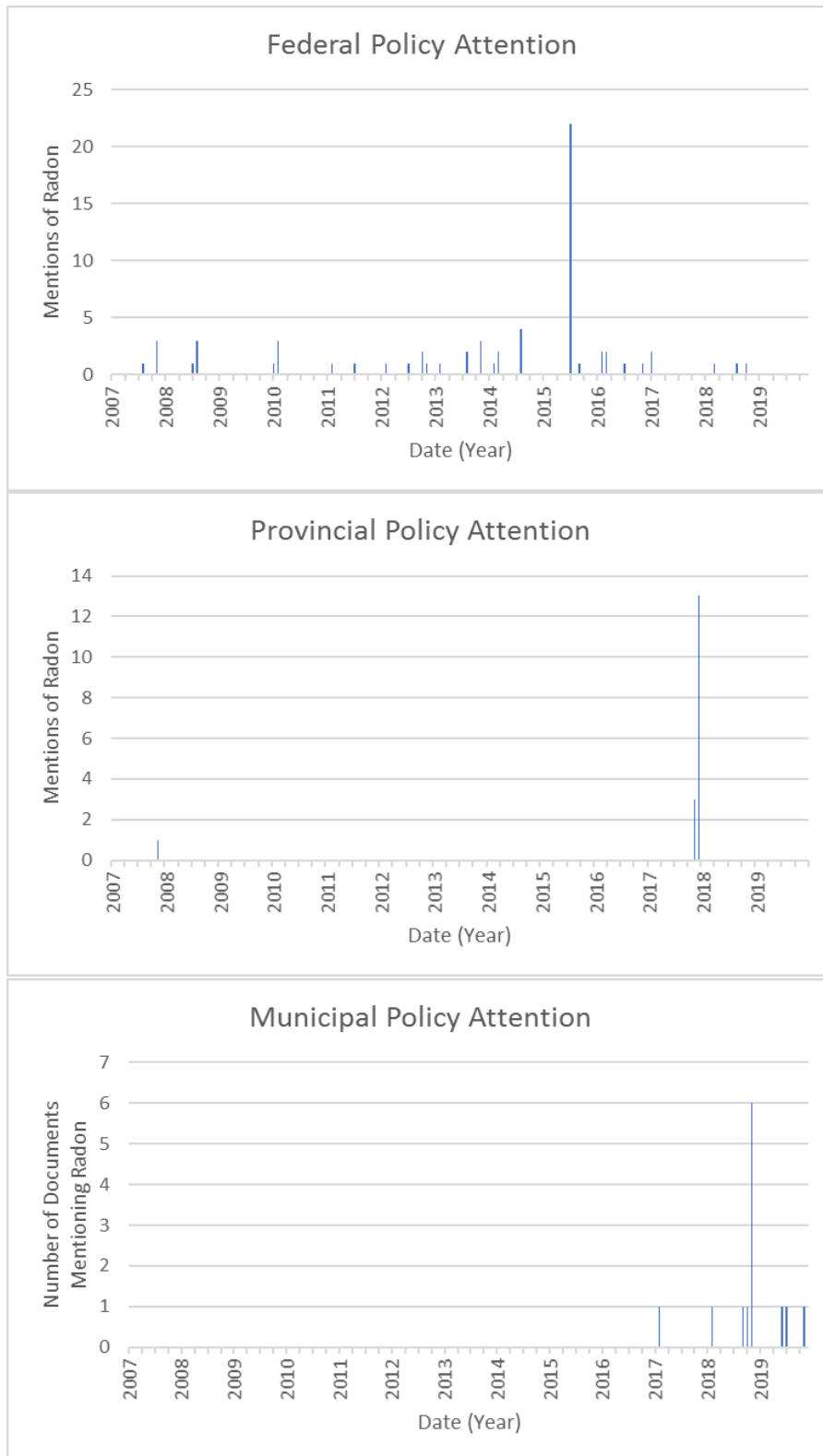


Figure 4.7. Federal, Provincial, and Municipal attention to radon over time.

Municipal data is not comparable to the provincial and federal policy attention as it samples different documentation. Interestingly, attention to radon only appears from 2017 onward, following both the federal and provincial peak in attention (Figure 4.7). In November of 2018 where there appears to be a spike in attention, the City of Calgary reviewed the *One Calgary 2019-2022 Service Plans and Budgets* report in city council meetings. This report mentions radon in a list of other issues which the city identifies as having raised awareness already and anticipate will require continued attention. It is also noteworthy that from the City of Calgary webpage search bar, a search for radon will find a list of webpages the first is titled *Radon - What you need to know*, and the following are various planning and permit documents. The webpage *Radon - What you need to know* is Calgary's radon information webpage, it defines radon, encourages residents test for radon, and notes new construction and renovations are subject to the radon requirements of the Alberta Building Code.

4.4 Policy Action

Using the measurement of all regulations and Bills proposed and passed for policy action, returned limited results. Alberta's Bill 209 – *Radon Awareness and Testing Act* which was passed in December 2017, was the only measured policy action that followed a period of intense public attention.

There has been other policy action however it does not correspond to the specified periods of interest in 2014 and 2017. The National Radon Program was launched in 2008, and the cross-Canada radon survey was initiated the following year. In 2010 rough-ins for radon were incorporated into the NBC for new builds and renovations. Lastly, the annual Radon Action Month was launched in November of 2013. Each of these actions have encouraged radon testing and made mitigation easier. But, despite the intense peaks of public attention that occurred in 2014 and 2017 further regulations and policies are limited, and efforts remain largely focused on awareness.

Chapter 5. Analysis of the Issue of Radon

The analysis is organized into three sections. The first two sections assess the proposed hypotheses for the peaks of attention in 2014 and 2017, respectively. The first hypothesis predicts that there is an issue attention cycle in the context of radon. The second hypothesis predicts that public attention influences policy attention and action. In the next section the implications of the conceptual framework are addressed. Policy entrepreneurs and policy windows are introduced into the issue attention cycle and many of the defining characteristics are examined in the radon context.

Radon aligns with the three issue attributes that Downs (1972) presented as making an issue more likely to experience the issue-attention cycle. These attributes of radon were previously discussed in the methods section but are returned to here. First, the majority of the population doesn't suffer directly from radon as an issue for it to keep their attention. Not everyone is aware of radon and of those aware, few have tested and very few are diagnosed with radon induced lung cancer. The second attribute is the existence of an arrangement where it benefits the majority or a small powerful minority to not act on the problem. Radon testing and mitigation is an added cost to the homeowner or homebuilder. The homeowner will see some benefit to testing and mitigating, but the true benefit of taking preventative measures and lowering lung cancer rates is spread to the majority of the population. The concentrated cost and diffuse benefit of testing for radon is another reason why this issue may be ignored. Lastly, radon is not by nature an exciting issue and it does not persist in media coverage. One of the interviewees described how overtime it becomes more difficult to garner the attention of the media and the public (Weston Jacques, interviews):

When we [Evict Radon] first started, it was really easy to get the information out there because there was no one really doing what we were doing or speaking to radon the way we do. Since that happened, three years ago, more mitigation companies have come to the province. ... Knowledge of radon in Alberta has gotten way better than what it was. So, for us, it makes the messaging, or it makes the outreach a little bit harder. ... As much as our research is changing, the side of the research that's not changing is 'radon is bad, and you should test your home'. It's that similar messaging. And so, if you didn't listen to us the first time, how do I say that same thing a little bit differently, so that you do pay attention now?

Additionally, radon is most often competing for attention against other health issues. This is especially true for policy makers, as radon is a part of the health portfolio.

5.1 Radon Attention In 2014

The issue-attention cycle has 5 stages that describe a characteristic shape of a sharp increase followed by a slow decline. As seen in Figure 4.5 there are discernible peaks in attention to radon, however the shape of the peak in June 2014 is sharp. The sharp increase in attention is not followed by a subsequent gradual decline. There is a pre-problem (stage 1) level of attention and post-problem (stage 5) level of attention which is slightly elevated in both media and public attention. This might suggest a punctuated equilibrium pattern of a lower level of public attention interrupted by a sudden shift, then a new established higher level of public attention. The nature of this curve was described by an interviewee (Aaron Goodarzi, interviews);

...it's almost impossible to stay in the public eye with that type of attention for the long term. But what you tend to get is, if this is your baseline, when you start, you get the blip, and it goes back down, but now your next baseline's a little higher, and the next blip and your next baselines a little higher, and you keep going. Although, it's doing this, your net is going up and up and up...

As the public interest appears to drop suddenly, stages 3 and 4, the realization of cost and gradual decline of public interest, do not appear to exist in this cycle as they have been described by Downs (1972). It is possible that public attention declines faster than described by Downs (1972) as radon is an issue that can be easily ignored, as it is a long-term risk and not an immediate threat. After June 2014 public attention does peak again each subsequent November, which is radon action month, but public attention is never sustained.

Stage 2 of the issue-attention cycle is described as *Alarmed discovery and euphoric enthusiasm*. The sudden spike in public attention would suggest that the public is suddenly aware of the problem, and the following decline suggests the issue might have failed to arouse alarm amongst the public. The sense of “do something” may not come to existence amongst the public. This may be for a number of reasons including a lack of perceived risk. By nature, radon is an invisible and long-term risk having no physical cues or immediate threat may allow the public to dismiss the risk. Behavioural research has suggested optimism bias (this won't happen to me) and availability bias (this hasn't happened to anyone I know), along with the voluntary nature of radon testing as being additional impediments to the public taking action (Howe 2020). A need for repetition of messaging was identified in the interviews (Kelley Bush, interviews):

...it is a long-term commitment that requires regular and consistent repetition. It's not an issue that they can have a program for a while, address it, set up the policies and then it'll all be good. There's going to be a need ongoing to

continue to repeat every fall and remind people about the issue that they should be testing. Unless or until it's [testing is] mandated.

In addition, radon is different from other social issues as it is the responsibility of the individual to test and mitigate the risk. When the cycle moves to stage three, it is realised that the burden falls on the individual, giving further reason for inaction.

In the case of radon, there is a back and forth affect between public and policy attention. This is most evident at the federal level of jurisdiction which will be the focus of this discussion. Provincial and municipal policy attention to radon were not apparent during the June 2014 peak, but are returned to in later discussions.

Policy attention precedes the June of 2014 peak in public attention with the national radon guideline being lowered from 800 to 200 Bq/m³ in 2007 and the launch of the National Radon Program in 2008 (Figure 5.1). There are 5 components to the National Radon Program: education and public awareness, national radon laboratory, radon testing projects, database and mapping radon potential, and radon research (Chen 2015). Over the first 7 years much of the work was done to build capacity within Canada. This included organizing the industry and lead to a better understanding of the challenges being faced. For example, it was recognized that the approach Health Canada wanted to take to address radon, such as the “philosophy of testing”, differed from the USA where radon professionals were being trained and educated (Deepti Biljani, interviews). In the USA a lot of short-term (1-5 days) testing is conducted but this is not recommended by Health Canada, as long-term (90 days) testing is much more accurate. The Canadian Association of Radon Scientists and Technologists (CARST) was founded in 2011. Then in 2012 a memorandum of agreement was drawn between Health Canada and the American Association of Radon Scientists and Technologists (AARST-NRPP) to develop a Canadian subsidiary of the proficiency and training programs. In 2014 the subsidiary C-NRPP (Canadian - National Radon Proficiency Program) was launched in Canada (Figure 5.1). Other research and facilities, like the secondary radon chamber, were also attained in Canada to provide quality control and current information that is more specific to radon in the context of Canada.

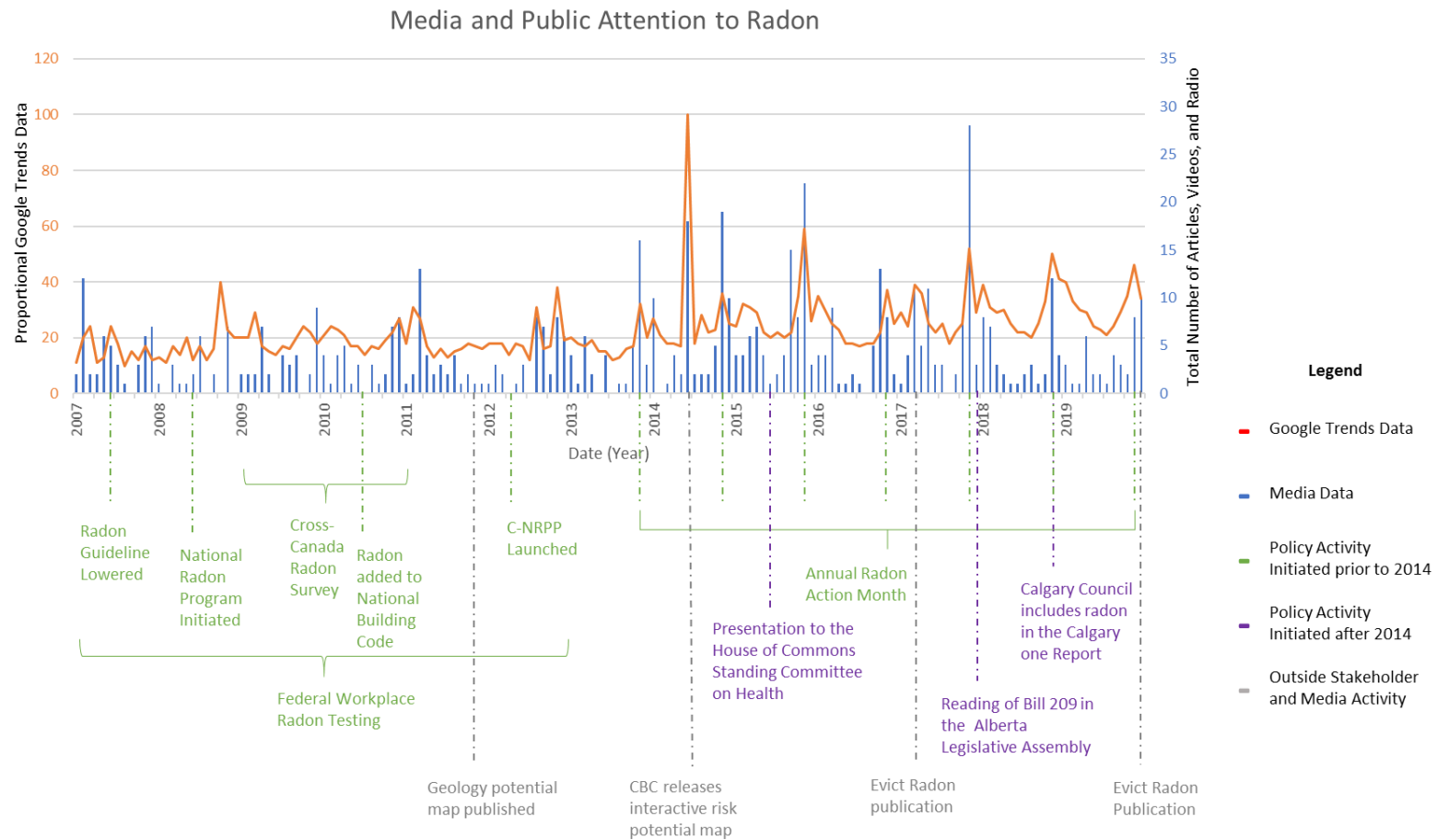


Figure 5.1. Media and Public attention to radon with a timeline of events and policy attention.

On the education and public awareness side of the national radon program, messaging took a national perspective and relationships were built with the provinces in the early years of the program. Getting stakeholders, such as the provincial lung associations, involved in their work and coordinating on awareness campaigns was critical but often met with resistance. An interviewee described the process (Kelley Bush, interviews):

With radon, it takes a lot of repetition. It's maybe the third or fourth conversation with the various jurisdictional authorities at the provincial or municipal level that may finally lead to policy action. ... It's very similar to the process that people go through for testing as well. Yeah, I've heard about it. Oh, I want to test. I'm going to test. Oh, I talked to you last year, I was going to test, I'm going to do it this year. I find the policy development/policy change process, very similar.

With limited resources a strategic approach was sought. A feasibility study was undertaken to examine how to best bring together stakeholders and utilise media to have the greatest impact. Through this study and a call for proposals the Take Action on Radon network was developed, and radon action month established. The first radon action month was held in November of 2013 (Figure 5.1) and continues annually each November.

There was, to a certain degree, a constant level of public and media attention to radon during the launch of the national radon program. Dynamics changed in 2013 when Radon Action Month was launched, and media was used as a policy instrument to disseminate information. The June 2014 spike follows seven months after the first Radon Action Month (Figure 5.1).

In June of 2014 the CBC released an interactive radon risk potential map and multiple local stories about areas of potential higher risk. This media attention drove the public attention spike seen in Figure 5.1. The map produced by CBC used data from multiple Health Canada reports including the *Cross-Canada Survey of Radon Concentrations in Homes* released in 2012. This data is a set of indicators that the government routinely measures to assess the magnitude of the radon issue and monitor changes, as well as assess the impact of the radon guideline and information campaigns like Radon Action Month. The news stories stemming from the mapping of this data highlighted where risk potential was highest and raised awareness of the problem amongst the public. In this way, policy attention to radon was captured by the media in the risk potential map which heightened public attention to radon.

The June of 2014 CBC interactive map is seen as the significant “watershed moment” for the federal program. Public inquiries spiked around this time from a couple of calls a day to

hundreds (Katelyn Penstone and Kelley Bush, interviews). This heightened public awareness was beneficial to the National Radon Program, but the more significant impact was how it enabled more effective engagement with stakeholders. Following the media exposure, the resistance that was typically encountered when engaging with provinces, municipalities, and stakeholders had dissipated. It was common for interviewees to explain how a conversation explaining the problem often lead to a more receptive audience, whether the audience was the general public or policy-makers. Kelley Bush (interviews) of Health Canada explained how the peak in public attention in June of 2014 affected engagement with stakeholders:

We got over that perception of it being a difficult or challenging issue or not having the resources, to becoming a positive thing to do, and a positive message to put out to their community members.

The period of heightened public and media attention influenced further policy attention that was more widespread.

The progress made in raising radon awareness and education by the National Radon Program as well as the impact of the CBC interactive map is believed to have influenced the decision for the House of Commons Standing Committee on Health to conduct a study on lung cancer in June of 2015 (Kelley Bush, interviews; Figure 5.1). In particular, the meeting focused on the causes of lung cancer including radon gas. Unfortunately, the meeting occurred right before summer break so the potential for follow up and reporting never occurred.

Policy attention continues at the federal level however policy action has been limited. The National Building Code (NBC) is the most recent example of policy action at the federal level, where radon was incorporated into the code for new builds and renovations in 2010 (Figure 5.1). There is pressure for more action to be taken in the NBC as well as elsewhere however, the federal government's largest challenge to achieving policy change is the multi-jurisdictional nature of this problem. Guidelines and standards can be set at the federal level but it is up to the provinces and municipalities to adopt and implement them.

5.2 Radon attention in 2017

Radon emerged as an issue in Alberta in 2017 (Figure 5.1). Although, public attention did increase in Alberta due to the CBC interactive map, policy attention was not measured until 2017. While there was an increase in public attention across Canada, the intensity of public attention in Alberta was highest in 2017 and so it is focused on here.

There are two discernible peaks in attention to radon in March and November of 2017 (Figure 5.1). The peak in March is less intense but it reflects the characteristic shape of the issue attention cycle. There is a sharp peak in March that gradually declines into May when a new post problem stage is established. In contrast to 2014, stages 3 and 4, the realization of cost and gradual decline of public interest, do appear to exist in this cycle. The peak in November coincides with radon action month and is similar to other peaks associated with radon action month in that it is sharper.

Radon came about as an issue in Alberta as a result of a research project which grew to include the Evict Radon non-profit organization. In 2013 a study began at the University of Calgary taking a closer look at radon levels in Calgary and the surrounding area. The research took a citizen scientist approach whereby participants voluntarily purchased and completed 90-day radon detection kits and completed a survey about the metrics of their housing (Stanley et al. 2017). This study first received media attention in 2015 when it was featured on the front page of the Calgary Herald Weekend Edition (Aaron Goodarzi, interviews). The effect of this media exposure was described by an interviewee (Aaron Goodarzi, interviews):

... they got I think over two and a half thousand requests that weekend for tests. That was when we realized the power of a citizen scientist-based approach to radon testing.

The survey was completed in 2016 and results published in 2017. The momentum of this project lead to the creation of Evict Radon, a non-profit organization focused on raising awareness on radon and engaging citizen scientists. Furthermore, another surge of media and public attention following the publishing of the results lead to the hiring of a communications expert, with the intention of harnessing the media attention to expand the reach of the research.

There is a discernible peak in media and public attention in March of 2017 (Figure 5.1) which can be attributed to the publishing of the Evict Radon research. Public attention is sustained into April before decreasing. This is significant considering other media campaigns were typically seen to be associated with sharp peaks, sudden increase followed by a sudden decrease. In the following November, Evict Radon released a campaign in alignment with Radon Action Month. One of the interviewees described it as such (Weston Jacques, interviews):

We built the full campaign strategy for the fall, and we pitched it to the press on November 14, 2017. And they all picked it up. Everybody picked up the study, specifically CTV did an amazing job ... one of the things she said was,

“university researchers looking to evict radon from our homes”, it could not have been a better language for what this campaign stood for.

In addition, over half of the media attention measured in November of 2017 is from CTV News (Figure 4.4). The impact of these strategic media campaigns was seen as a major increase in the number of participants signing up to the study, from about 1000 per year to 6000 in the year of 2017 (Weston Jacques, interviews). The media attention Evict Radon was harnessing also drew the attention of both provincial and municipal governments.

At that time the Alberta provincial government was being led by the New Democratic Party (NDP). The 2015 election was the first change away from conservative leadership in forty-four years (Sutherland 2019). This meant new priorities and spending for the provincial government. For example, Energy Efficiency Alberta was launched in 2017 funding initiatives and rebates on residential and business energy efficiency improvements (Government of Alberta 2016). The change in government made drafting new legislation on radon favourable.

In 2016 Robyn Luff, a Member of the Legislative Assembly (MLA) representing Calgary East, contacted Aaron Goodarzi about his research after having read about it in the news (Aaron Goodarzi, interviews). A meeting was held with Robyn Luff, Aaron Goodarzi, the Deputy Minister of Health, and the Director of the Charbonneau Cancer Institute to discuss the potential of collaboration on a piece of legislation. Robyn Luff was elected as an NDP MLA in 2015. Before entering political life, she worked in education as a teacher. She remains an independent candidate and advocate for “education, poverty reduction, and democracy” (Luff 2015). Bill 209 was authored by Robyn Luff and read in November and December of 2017; it was passed unanimously (Figure 5.1). Bill 209 is the single example of policy action found. Currently, Bill 209 has received Royal Assent but has not yet come into force. As it undergoes stakeholder consultation, the bill awaits proclamation and the date it will come into effect.

Bill 209 extends some of the federal initiatives to a provincial level and more importantly requires testing, albeit limited. Bill 209 establishes a provincial plan to produce educational material, facilitate public awareness campaigns, and requires testing for radon upon licensing of childcare programs. The educational materials are meant to target the public and more specifically “purchasers in residential real estate transactions” (Alberta 2017). Real estate transactions have been identified as an effective way to raise awareness and encourage action on radon (Dunn and Cooper 2014). Requiring testing of the premises of childcare programs is done

so at the time of licensing or renewing the license for a program. Using an already established mechanism such as licensing is an effective way to ensure compliance. Furthermore, a plan to reduce levels of radon must be provided if the results of the test are above guidelines.

Policy action regarding radon in Canada has for the most part not taken a regulatory approach but instead an advisory approach. The Canadian radon guideline is just that, a guideline with little mechanism of enforcement. Radon risk has received attention but action to reduce the risk ultimately falls to the responsibility of the individual. This placement of responsibility has been explored by interest groups such as CELA and recommendations like incentives in the form of tax refunds and radon testing at the time of realty transactions have been suggested (Dunn and Cooper 2014). Bill 209 is the only example of policy action found in this case study and one of the few examples where testing is made a requirement within Canada.

The Evict Radon study surveyed homes in Calgary and the immediate surrounding areas raising public attention. Prior to this study within the municipal government of Calgary there was little to no attention given to radon. In fact, it was an initiative of the Evict Radon non-profit organization to contact and collaborate with municipalities to update their information resources such as 311 phone lines and webpages (Weston Jacques, interviews). Evict Radon worked with the city of Calgary to update its webpage (<https://www.calgary.ca/uep/esm/strategic-environmental-initiatives/radon.html>) and 311 phone line scripts in October of 2019. In addition, Calgary had identified radon amongst other issues that would require more attention in the *One Calgary 2019-2022 Service Plans and Budgets* report published at the end of 2018 (Figure 5.1). Public and media attention preceded policy attention within the city of Calgary.

5.3 The Conceptual Framework Revisited

The issue attention cycle may coincide with a policy window; the increase in public attention to an issue may force open a window of opportunity for policy action to be taken. Policy entrepreneurs must be ready to push their policy idea through the open window, as it may quickly close again. The policy entrepreneur is characterised as being willing to “invest their resources -time, energy, reputation, and sometimes money- in the hope of future return” (Kingdon 2003, 122). As the policy entrepreneur seeks to push a policy through an open window they will work to keep a problem in focus, fighting the dynamic of the issue attention cycle. In the context of radon, public attention generally increases and decreases quickly (Figure 5.1),

suggesting the policy window may be short lived. However, there are many working inside and outside of government to continue to peak media and public attention and who have increased the overall public attention to radon over time (Figure 5.1).

In the next section, connections are made between the observed data and the conceptual framework. First, the policy entrepreneur will be examined for their characteristics and their role. This is followed by a discussion of how and why they were identified amongst the other policy actors, and at varying levels of government. Thirdly, open policy windows will be identified along with the mechanisms which contributed to their opening and the consequential policy attention and action or inaction. Lastly, observations of the features of radon that cause policy windows to open and close will be expressed.

5.3.1 The Issue-Attention Cycle and the Policy Entrepreneur

Within Alberta I propose that a policy entrepreneur emerged. However, there isn't enough data to be conclusive in the identification of this policy actor. Mintrom and Norman point out that "In any given instance of policy change, it is usually possible to locate an individual or a small team that appears to have been a driving force for action." (2009, 651). Although this individual or small team can be identified, they need to be studied in a way which puts emphasis on contextual factors. Here I will make an argument for one possible policy entrepreneur but as I cannot definitively rule out others, this is an inference at best. Despite these limitations, an examination of the interaction between actors and the issue attention cycle is valuable.

There are common qualities that are typical of a policy entrepreneur which the Evict Radon team exhibit. The non-profit organization Evict Radon raises radon awareness and pursues research "across disciplines to gain the information necessary to (i) learn how to engineer out the Radon from our buildings before they are even built, (ii) to identify who are the most at risk from Radon in society, and (iii) make meaningful change to policy across sectors." (Evict Radon 2020). The lead researcher of Evict Radon, Dr. Aaron Goodarzi, invests his resources, time, energy, and reputation, into this pursuit. There are three qualities of a policy entrepreneur that Kingdon identified when developing the concept, they have a claim to a hearing, known for political connections or negotiating skills, and persistence (Kingdon 2003). As an expert in cancer research and the Canada Research Chair in Radiation Exposure Disease,

Dr. Goodarzi has a claim to a hearing. Additionally, the Evict Radon team was developed to be interdisciplinary and includes experts in communication and architecture. In coordination with Dr. Goodarzi, the communications expert plays a key role in opening and maintaining a network which includes other radon experts, industry professionals, and government, keeping Evict Radon well connected. Lastly, a policy entrepreneur is persistent and spends a significant amount of time pushing their idea forward. Since 2013 when research began Evict Radon has consistently been working to expand and are now extending their research from a provincial to a national level. This has come about through many media campaigns, public outreach events, and many other efforts to push their mission forward.

Evict Radon engages with media in a strategic way to have the greatest impact in raising public and policy attention. Media releases of their latest research results are pushed by their own communications specialist as well as the communications team at the University of Calgary (Weston Jacques, interviews). Each year new digital campaigns are run and are used to target certain communities and to extend the Evict Radon reach. Evict Radon also holds public outreach events and presentations for private sector groups. In collaboration with the Real Estate Council of Alberta (RECA) an educational course for realtors was created (Aaron Goodarzi, interviews). Realtors must relicense every year presenting a mechanism through which every practicing realtor in Alberta was educated on radon. Realty transactions have been suggested as a good mechanism through which to either raise awareness on radon testing or to mandate testing (Dunn and Cooper 2014, Quastel 2018). The realtor education course was well reviewed and received an ARELLO Award (Association of Real Estate License Law Officials), putting an international spotlight on Evict Radon (Aaron Goodarzi, interviews).

The significance of the collaboration with realtors needs to be emphasised, as in early assumptions it was predicted that realtors would want to ignore the issue of radon as it may diminish the value of a home. Contradictory to that assumption, the provinces real estate governing body, RECA, emerged as an ally. Support of the real estate industry may be a result of tactful problem definition by the policy entrepreneur, but this requires further analysis.

Evict Radon has taken a citizen science approach to their research which sets them apart from the rest of the actors in the radon space. By defining themselves as researchers first it gives them more credibility amongst the public as well as with policymakers (Weston Jacques, interviews). Citizen science is scientific work, such as data collection and interpretation, that is

done by the general public under the direction of a scientist (Ullrich 2012). Citizen science has seen growing use in the natural sciences, especially ecological studies, but is rather new to other fields. Radon as an environmental health risk, and a cause of cancer, has not been studied using this approach before. The citizen science approach to research was identified in the interviews as contributing to sustaining public attention (Aaron Goodarzi, interviews)

But the big thing that keeps people engaged, is they get the first look at the research as it comes out. There's an invested interest. They've invested their time and a little bit of money into helping us as citizen scientists and we pay them back with, here's what we did with the data that you contributed.

In this way Evict Radon works against the dynamics of the issue attention cycle. By engaging the public and sustaining attention they are delaying the gradual decline of public attention, extending the issue-attention cycle.

5.3.2 Identifying the Policy Entrepreneur

Evict Radon has been argued to be a policy entrepreneur within Alberta. However, other policy actors and contextual factors have been ignored. Further research examining policy entrepreneurs identified four elements crucial to their role of promoting a policy idea. These are social acuity, defining problems, building teams, and leading by example (Mintrom and Norman 2009). The examination of these elements requires the consideration of contextual factors in constraining or promoting certain actions. Though many of these elements can be identified in the case of Evict Radon, it would be best to leave that discussion for another study where a deeper investigation can be conducted.

In 2016, Robyn Luff began work to draft Bill 209 – *The Radon Awareness and Testing Act*, investing her time, energy, and reputation to this effort, same as a policy entrepreneur. There were multiple stakeholders involved in the Bills drafting, but most importantly the author of the bill, should be considered as a possible policy entrepreneur. Robyn Luff was elected as an NDP MLA in 2015 and took interest in issues around family and education (Luff n.d.). Her interests are reflected in Bill 209 as it requires testing for radon in childcare facilities at the time of licensing or relicensing. Robyn Luff's claim to a hearing exists as an MLA representing her constituency. However, in terms of political connections and negotiating skills there is no evidence to support her. In fact, having come from education into politics suggests her experience and connections would be minimal.

The final quality of a policy entrepreneur is persistence (Kingdon 2003). Kingdon further explains “these people spend a great deal of time giving talks, writing position papers, sending letters to important people, drafting bills, ... all with the aim of pushing their ideas” (2003, 181). Robyn Luff worked with many stakeholders to draft Bill 209 (Aaron Goodarzi, interviews), however persistent efforts beyond this collaboration are not evident. As the author of Bill 209, Robyn Luff was critical however there is little available evidence to further support identifying her as a policy entrepreneur.

According to Kingdon (2003) the position of the policy entrepreneur, inside or outside of government, does not matter to their success. The position, inside or outside of government, affects what resources are available. The policy entrepreneur proposed to exist in 2017 is a researcher in a non-profit organization, outside of government. The position of the policy entrepreneur may be a point of variance in how the multiple streams approach is applied outside of the US presidential system. However, this needs further research and theorization of the policy entrepreneur in Canada.

Those working to increase radon awareness within the government are competing with many other priorities and can be constrained in their actions by existing processes. For example, the process the National Radon Program would have been required to take to establish Radon Action Month involves a lengthy parliamentary process (Kelley Bush, interviews). This is not the case for an outside organization. The efforts of the National Radon Program instead led to the creation of the Take Action on Radon Network which subsequently established Radon Action Month. The impact of establishing the Take Action on Radon Network is diverse and context specific. The Take Action on Radon Network may sustain public attention however within the measure of this research it is not discernible. Additionally, the influence this has on further policy attention and action is known to exist, but it is unclear in what capacity. For these reasons a policy entrepreneur within the federal government cannot be identified although important policy actors exist there.

5.3.3 The Issue-Attention Cycle and the Policy Window

The policy window represents an opportunity for action, when the three streams can be brought into alignment. Policy windows generally open due to a change in the politics or problems stream, and as quickly as policy windows open, they also close. When an issue peaks

in media and public attention it can open a policy window. The policy window may close when public attention fades and pressure on policymakers to act decreases or when the realization of cost diminishes political will to act.

In June of 2014 when the CBC released an interactive radon risk potential map a policy window opened. The media brought attention to the issue of radon and presented the Health Canada data in a way which had not been done before. The presentation of the data as an interactive map made the data more readily interpreted by the public and policymakers, magnifying the indicators of this issue in the problems stream. The media push and subsequent rise in public attention opened the policy window, and increased pressure from the public on policy makers. This open window led to further success of the National Radon Program to garner attention, especially when it came to building relationships with provinces, municipalities and other stakeholders (Kelley Bush, Interviews). Radon made it onto the government agenda however it did not ascend to the decision agenda.

Although a policy window opened in 2014, no policy change was measured. The problems, politics, and policy streams were aligned at this time however it was not possible to identify a policy entrepreneur. The lack of a policy entrepreneur means that the streams may not have been coupled and could be a factor in the issue failing to reach the decision agenda. There are other reasons why the policy window may have closed, ending the opportunity for policy action. For example, there may have been a lack of policy options available in the policy stream (Kingdon 2003). In 2014 it was difficult to discern policy attention at the provincial and municipal level, while the National Radon Program was still working to raise awareness and build networks (Deepti Biljani, Kelley Bush, interviews). Furthermore, as the issue-attention cycle suggests, the decline in attention may have also signalled a decrease in public pressure on policy makers and a loss of political will to act. This kind of change in the politics stream also could have closed the policy window.

In Alberta, a policy window was opened, and the issue of radon moved from the government agenda to the decision agenda. In March of 2017, Evict Radon published research that focused on radon in Calgary and the surrounding area. This research showed two alarming results which captured media, public, and policy attention. First the problem was worse than previously estimated, and second newer built homes (1992 or later) on average had higher levels of radon than older (Fintan et al. 2017). This new information about the indicators of the radon

issue represent a change in the problems stream and the pushing open of a policy window. Later that year in November of 2017, Evict Radon pursued a large media campaign to raise further awareness to radon and encourage testing. This campaign again raised public attention and propped up the open policy window.

The Evict Radon research and media attention garnered some policy attention prior to 2017. Dr. Goodarzi was contacted by Robyn Luff, an MLA in the Calgary region, in 2016 about the possibility of collaboration on legislation. This action may have set the policy stream on route to align with the problems stream. A bill was drafted from 2016 through 2017 with collaboration from Evict Radon, RECA, Alberta Real Estate Foundation, and other stakeholders (Aaron Goodarzi, interviews). Bill 209, The Radon Awareness and Testing Act increases the provinces role in raising radon awareness and requires radon testing of the facilities of childcare programs at the time of licensing or relicensing. Earlier drafts included more emphasis on real estate transactions. But when the time came for Bill 209 to be read, it took quick action to revise these components out of the document to ensure it did not conflict with the jurisdiction of other governing bodies (Aaron Goodarzi, interviews). The early alignment of the problem and policy stream was advantageous to the unanimous passing of Bill 209.

The politics stream of Alberta was favourable to new initiatives. An NDP government had come to power as a result of the 2015 election, a change from the 44-year reign of the conservatives. Under the leadership of Rachel Notley there were many ideas which supported and improved social justice on the new government agenda, such as increasing minimum wage (Thomson 2019). The change of government allowed an opportunity for new priorities to be set and new policy ideas to make it on the agenda. Furthermore, the maturity of the Evict Radon research within the province suggests political forces were, even now, organized in support of increasing radon awareness. The mix of government personnel, researchers, non-governmental organisations, and non-profit organisations involved in the initial stages and drafting of Bill 209 further supports the idea that consensus within the politics stream was being built through out 2017.

Ultimately, within Alberta there is evidence that the three streams of politics, policies, and problems aligned. I propose a policy entrepreneur emerged and was successful in coupling the streams. The policy window was opened early in the year by the indicators of research showing a worsening of the problem. The window was propped open further by the information

campaigns of Radon Action Month and this permitted the passing of Bill 209 in December of 2017.

5.3.4 The Opening and Closing of Policy Windows

The issue of radon is apart of the natural environment and accumulates in buildings due to how they interact with the ground below them. For this reason, as an issue radon needs continued messaging, it is not a one-time fix (Kelley Bush, interviews), suggesting the radon policy window will continue to open and close.

In the radon space there are various actors working to raise awareness. For example, Radon Action Month is an annual effort to promote testing and mitigation that creates a spike in media and public attention (Figure 5.1). However, sustaining public attention for even a short period of time is difficult. An interviewee explained (Aaron Goodarzi, interviews)

But keeping people's attention is an art form. And you cannot sustain the huge spikes permanently because that's just not the way humans work. ... our news cycle is so volatile. With so much horrific stuff going on, it's extremely difficult to compete with that. We put a great deal of effort into timing our news releases, and our research. Then we just cross fingers and hope that Donald Trump doesn't tweet something that is incendiary or that there is a major disaster. That's a roll of the dice, but nevertheless is part of the whole strategy.

The radon policy window can be opened by a peak in public attention, but it is closed when public attention doesn't translate into pressure, or when competition does not allow radon to be a priority. The short-lived nature of public attention may prematurely close a policy window before policy action can be taken. Conversely, once the conversation has been opened it is likely that the benefits of having a radon policy or at least participating in an already established campaign is well received. This change in attitude toward radon policy was further described (Kelley Bush, interviews):

Once they started taking some action on radon awareness and engagement provinces, territories, and municipalities would realize, how well received it was, how easy it was, and how important it was because they would start to learn themselves about the link between radon and lung cancer...

Public attention is essential to the opening of the policy window, but further demonstrating the importance of radon policy is vital to policy attention and action.

Radon is a part of the health portfolio, putting it in constant competition with many pressing issues. Issues such as the opioid crisis and the novel coronavirus take priority over other preventative policies. Furthermore, provinces are hesitant to divert funds to preventative policies without a cost-benefit analysis. Research has only recently (2019) made available a cost-benefit analysis that shows preventative radon policies would reduce lung cancer (Gaskin et al. 2019).

Different strategies have been taken to harness media attention as a tool to raise public attention. Health Canada has worked with individuals to add credible voices to the conversation around radon and to create a radon spokesperson. This has included working with Canadian celebrities like Mike Holmes and Dr. Roberta Bondar. However, even these strategies are at the mercy of the media and the competition for attention. For example, many interviews had been scheduled with Dr. Roberta Bondar and Kelley Bush bringing attention to radon and relating it to radiation exposure in space (Kelley Bush, interviews). Unfortunately, all of the interviews were cancelled as a controversial video of the Toronto Mayor, Rob Ford, had surfaced on the same day. Many interviewees mentioned the importance of timing media releases and other action (Aaron Goodarzi, Weston Jacques, Kelley Bush, and Katelyn Penstone, interviews). The issue attention cycle is susceptible to the competition for public attention.

How risk is communicated adds additional complexities to raising radon awareness. Some communication can evoke a defensive response while others may allow for a false sense of safety or buy-in to biases (Hevey 2017; Howe 2020). For example, the mapping of radon risk potential can create a false sense of safety if the home is in a low to medium risk area. For this reason, the Radon map which Health Canada published is shades of red, to suggest no area is risk free (Kelley Bush, interviews; Government of Canada 2019). In an effort to help overcome biases, those working to raise radon awareness have also begun to share the stories of those affected by radon (Weston Jacques and Katelyn Penstone, interviews; for example see <https://www.ucalgary.ca/news/radon-gas-concentrations-may-be-even-higher-rural-alberta-big-cities>). By highlighting these stories, it makes the issue more relatable diminishing the availability bias someone may hold toward radon. In an effort to combat optimism bias, the attitude of this won't happen to me, other stories of young, healthy, non-smoking individuals who are battling radon-induced lung cancer are highlighted (for example see <https://saskatoon.ctvnews.ca/athlete-with-lung-cancer-warns-of-radon-levels-in-homes-1.4400666>). Risk communication can engage the public and prop open a policy window, or it

can have a negative response and allow the risk to be ignored. Many working to raise radon awareness seem to be aware of the importance of risk communication and actively work to share information that encourages risk reduction.

5.4 Limitations

It has been noted that the issue-attention cycle is a heuristic, leaving room for interpretation on how it should be applied (Peters and Hogwood 1985, Howlett 1997, Soroka 1999, Newig 2004, and Gupta and Jenkins-Smith 2015). This thesis draws a sharp distinction between attention and action, and it is possible that the definition of policy action has restricted the results of the study. Specifically, defining policy action as the decision to take, or omit, direct government action to address an issue in the form of a legislative bill or other regulatory change may have overlooked other kinds of policy action that were ongoing. Although the conceptual framework (Figure 3.1) recognized multi-directional interactions between the public, media, and policy attention, there was still linearity in how the framework was applied. The framework assumes an increase in media and public attention leads to an increase in policy attention and then to subsequent policy action, as the issue-attention cycle describes and in terms of what the multiple streams approach identifies as the governmental and decision agenda. This linearity further obscures the significance of continuing policy action that might be caused by issue attention. As seen in Figure 5.1, there were 7 different accounts of policy attention and action initiated prior to 2014, and only 3 accounts from 2014 onwards, while the analysis focused on 2014 and 2017. Had the definition of policy action been differently applied the analysis could have recognized the ongoing action.

Furthermore, both the issue-attention cycle and multiple streams approach were developed from studies of the US political system. The institutional structure of the United States differs from Canada chiefly by separating the powers of the administrative and executive branches of government. As a result, these approaches focus on the legislative branch of government and may underestimate the importance of public servants as policy entrepreneurs within Canada. Further theorization around how these concepts should be applied in different contexts is needed.

Chapter 6. Conclusion

6.1 Summary of Findings

This research explored the influence of public and media attention on policy attention and action in the context of the radon issue in Canada. By establishing a conceptual framework which supplements the issue attention cycle with the multiple streams approach to agenda setting, periods of intense public and media attention were examined. Two hypotheses were analyzed in the context of radon in Canada. First, the issue-attention cycle was predicted to exist, meaning there are discernible peaks in public attention that rise rapidly and slowly decline. Second, the public and media attention generated by the issue-attention cycle influences policy attention and action. A mixed-methods approach allowed for quantitative data to be supported by qualitative data. The qualitative data also furthered the discussion of results adding context and perspective to the possible explanations of how and why policy attention and action, or inaction, occurred.

Two periods of intense attention were focused on to examine the hypotheses. In June of 2014 an interactive risk potential map released by the CBC created the most intense peak of public attention. Later, in 2017, the release of research from the University of Calgary and the Evict Radon team created a peak of public attention in March and the subsequent November Radon Action Month campaign saw the greatest intensity of media attention. Though these are discernible peaks in public and media attention to radon, they do not always display the characteristic shape of the issue-attention cycle. The issue-attention cycle is described by Downs (1972) as having a sharp increase followed by a slow decline. It was more commonly observed that peaks in public attention were sharp, both in increase and decline. The peak of attention which occurred in March of 2017, is the exception. It increases sharply in March and sustains attention through April before declining again. In conclusion, the dynamics of public attention to radon do not always directly reflect an issue-attention cycle. However, the resultant appears to be the same; public and media attention peaks, there are few who act, and attention persists at a new average level of attention until it recaptures public attention again. Since the establishment of the Radon Action Month campaign in November of 2013, a corresponding annual peak in public attention has occurred, and there has been an overall increase in public attention.

The second hypothesis stated that policy attention and action would be influenced by peaks in public attention. It was observed that policy attention appeared in the different levels of government at different times. A single peak in public attention did not equate to widespread policy attention. It was a year following the June of 2014 peak in attention, and 7 years of progress made by the National Radon Program, when the House of Commons Standing Committee on Health held meetings which discussed radon as a cause of lung cancer. While at the provincial and municipal level there was no indication of policy attention until 2017 or later. Within the Alberta government policy attention centered around the drafting and passing of Bill 209, The Radon Awareness and Testing Act, in November and December of 2017. This followed the peak in public attention and was drafted with the help of stakeholders, specifically Evict Radon who had been raising awareness in the province for 4 years prior to this. At the municipal level policy attention came later still in 2018.

In the case of Bill 209 media and public attention brought radon to the attention of policy makers. With the support of stakeholders, the bill was drafted and passed unanimously. A policy entrepreneur was identified, but due to the limitations of the available data it is inconclusive. Nonetheless, there is evidence that the three streams were coupled and it was the collaboration of the stakeholders and policy makers drafting the bill which made it successful.

The issue-attention cycle opens a policy window as it presents an issue pressing on government. Working in the radon space are multiple actors such as government, industry, and non-governmental organisations, working to raise radon awareness and encourage testing. The existence of these actors and their work means the radon policy window opens and closes regularly. An open policy window is a necessary, but not sufficient, condition for policy action. This was observed in the data where a peak in public and media attention does not always translate into policy attention and action. The agency of the policy entrepreneur is critical to the coupling of the politics, policies, and problems streams and pushing ideas through the open policy window. In brief, public attention influences policy attention but there are more factors specific to the context that also contribute to policy attention and action. The second hypothesis is partially true and limited by the constraints of other factors.

6.2 Research Implications

This thesis applied the issue-attention cycle which has seen limited use in the Canadian context. The results were substantiated by both qualitative and quantitative data, allowing for a stronger discussion of the concept in this context. The use of Google Search Trends data is a development from previous research and allows for the distinguishing between public and media attention. Definitions of attention and action also provided clarity within the data and observations. The careful consideration of these elements led to results where it can be concluded that the dynamic of the issue-attention cycle exists though it doesn't always reflect the characteristic shape of sharp increase and slow decline.

The multiple streams approach to agenda setting has seen more use in the Canadian context however it needs further theorisation. Specifically, in the role of the policy entrepreneur and the resources available to them to push a policy idea.

This thesis has highlighted the dynamic relationship between public, media, and policy attention, similar to what Soroka (2000) suggested. Soroka's expanded model of agenda-setting suggested three separate agendas exist; the media, public, and policy agenda. These agendas interact with each other and real-world factors in different ways. Moreover, there are competing priorities or what he calls sub-agendas within each. For radon, intense peaks of public and media attention have been seen to influence policy attention, and strategic media use and awareness campaigns have influenced public attention. The use of modern measures of public attention, like Google Search Trends data, made it possible to explore these interactions. More direct and continuous measures of public attention could continue to support this expanded model of agenda-setting and lead to new insights.

6.3 Policy Implications

Competition for attention presents a challenge when trying to get people and policy makers to act. Attention is easily shifted to risks that are more pressing and events that are inherently exciting. Risks that are invisible or long-term, are more likely to gain attention by means of indicators which require interpretation. Moreover, in the case of a threat like radon specialists are needed to make the connection between radon and lung cancer, then communicate this risk it to the public and policy makers. Other competing issues can gain attention through triggers like focusing events which often create a sense of urgency. Focusing events allow policy

entrepreneurs to more readily couple the streams due to the sense of urgency. To face these challenges, much of the work in the radon space is focused on raising awareness and opposing the dynamics of public attention.

Rather than a series of events bringing attention to an issue organically, government, stakeholders, and the policy entrepreneur work with the media to raise public attention. Kingdon (2003) described the policy entrepreneur to be like a surfer waiting for the big wave. A media campaign which creates an issue-attention cycle is like a policy entrepreneur making their own waves in hopes it will push them into shore. In the radon space, media and strategic risk communication messaging has been used to increase attention. Campaigns such as the annual radon action month create periodic issue-attention cycles that could open a policy window. Looking outside of the representative cases in this research, there are municipalities which have hosted pilot projects or taken on other initiatives to address radon as a result of successful radon action campaigns (Dunn 2014).

Education and awareness have been key components of radon policy since the establishment of the National Radon Program in 2008. There are national awareness campaigns as well as more targeted efforts like creating pamphlets and other educational materials for specific professions. These efforts were described as trying to push and shift the bell curve so more people are aware of radon and more will test and mitigate (Weston Jacques, interviews). It was also acknowledged that part of the bell curve will never be reached using these tools. Furthermore, data from the Statistics Canada Household and Environment Survey indicates that of the households aware of radon only 5% have tested for it (Statistics Canada 2015). There are other policy instruments which could be used to overcome barriers such as competition for attention and risk communication.

It is often the case that policy issues require more than one approach to address them. This may include information tools, regulations, incentives, and using existing mechanisms such as licensing processes. In the case of radon in homes, it has been seen that information tools have increased attention overtime (Figure 5.1) but have limited efficacy (Statistics Canada 2015). Additionally, regulations in the NBC have made radon mitigation more convenient but do not directly lower the risk. Both approaches continue to place the duties on the public. Introducing a price-based incentive which complements the current information campaigns could be a way to increase testing. A rebate for homeowners who reduce the risk of radon in their home could be

introduced. An incentive could also be introduced as a part of an existing program, such as a home efficiency improvement program. Using existing processes such as real estate transactions has also been suggested by advocates as a way to increase awareness and mandate testing (Dunn 2014).

Competition for attention is one of the greatest challenges faced for policy change and action. The risk communication strategies that have been used to overcome biases concerning the risk of radon could be further utilised for other environmental health risks. Additionally, policy that continues to facilitate this work as well as incentives individual action to reduce risks can help to overcome the challenge of achieving action.

6.4 Future Research

This research has focused on the agenda setting stage of policy development, future research could extend to the full policy cycle. Howlett, McConnell, and Perl (2015) merged the theories of the multiple streams approach and the policy cycle, extending the streams beyond the agenda setting stage in the policy cycle. This framework could be used to apply to policy issues such as radon. This framework also discusses possible reasons why a policy may fail further in the policy cycle such as public consultation or stakeholder consultation process. Alberta's Bill 209 may be stalled from reaching proclamation at this stage, for example.

Radon may lend itself to policy learning as different jurisdictions face the same risk but address it in different ways. Distinct in this thesis was a citizen scientist approach to radon research that sustained public attention by engaging the public with cancer research. Other jurisdictions have engaged in pilot projects which translated into further awareness and testing (Quastel 2018). Policy learning provides an avenue to further explore the how and why of radon policy implementation.

Lastly, a barrier to policy change has been a lack of cost-benefit analysis. Recent research has made this available, and it would be expected that provinces and municipalities will be willing to take on new radon policies. However, the competition for attention persists, and under the current state of a global pandemic it is likely radon will continue to be pushed aside. Future research should focus on the overcoming the barriers to policy adoption and diversifying radon policy to include incentives and regulatory instruments.

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Appendices

Appendix A – Interview Questions

Interview Questions

The interviews will be conducted in a semi-structured style. Please, think of these questions as a general guide to the conversation.

Can you tell me a bit about your background and when and how did the issue of radon come to your attention?

When do you think radon came to the attention of policy-makers?

What kind of strategies has your organization developed to further radon awareness?

Has there been a person who has made significant contributions of their time and energy to ensure the success of any of these initiatives?

Looking at the figure below:

What events and policy development are not captured on this figure?

Could you tell me more specifically about what was happening around June of 2014?

Was there a person crucial to this rise in attention?

How about someone who used this rise in attention as an opportunity to pursue a policy idea?

Focusing now on every November since 2013 when Radon Action Month occurs, could you explain what kind of time and resources go into preparing for Radon Action Month?

Was there an individual who promoted the idea of Radon Action Month?

Have Radon Action Months been able to prompt policy action? If so, how was this done? If not, why not?

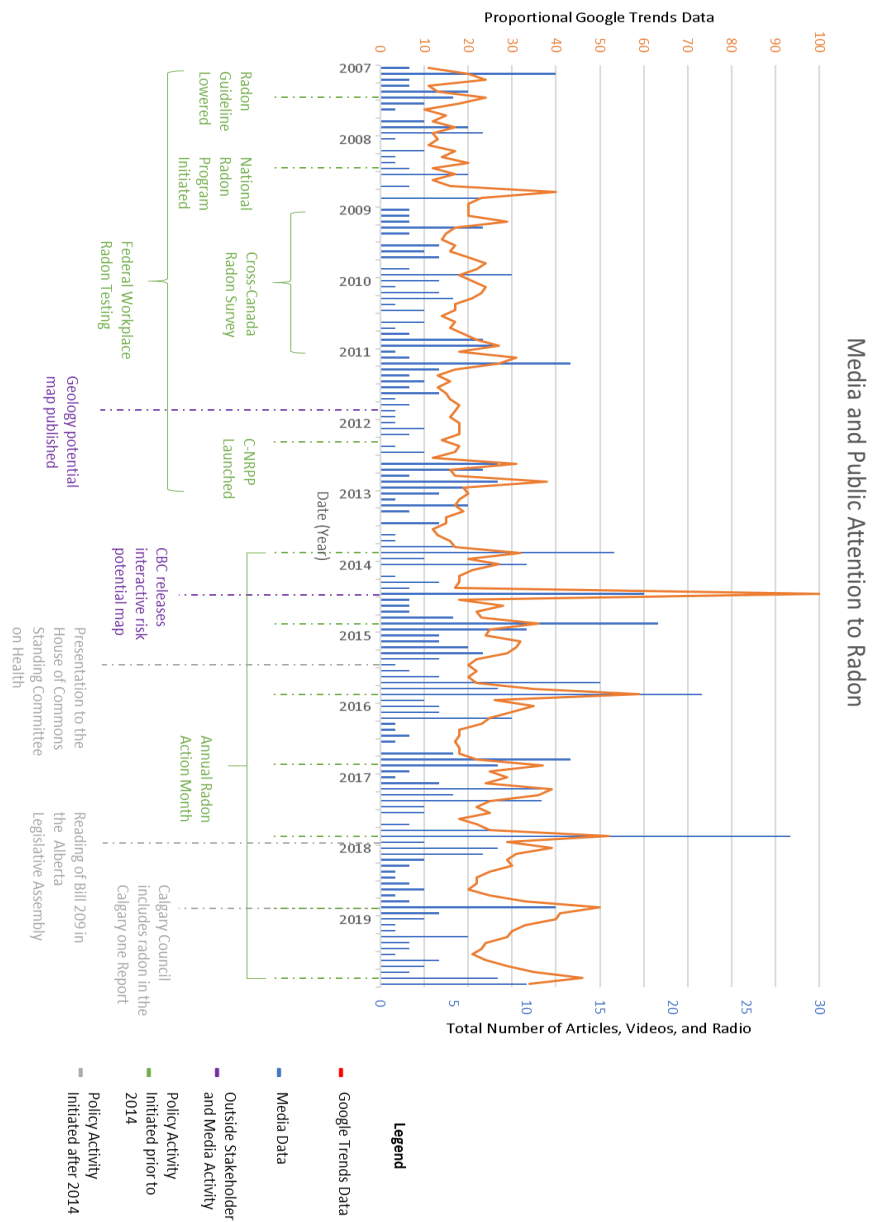
On June 18th, 2015 the House of Commons Standing Committee on Health saw multiple presentations on radon, as a part of their work on Lung Cancer in Canada. How did radon become apart of this study? Was there a person who advocated for radon to be a significant part of the meeting?

The Alberta government read and passed Bill 209 - *Radon Awareness and Testing Act* at the end of 2017. Could you tell me about the drafting of this bill, when did it occur and who was involved?

Radon was included in the *One Calgary 2019-2022 Service Plans and Budgets Report* as an issue that requires attention. What lead to radon being included in this report?

Can you identify some of the successes and challenges of raising radon awareness? What about the successes and challenges of policy action?

Do you have any examples, perhaps from other countries or jurisdictions, where you think radon awareness has been handled especially well?



Appendix B – Interviews

The participants mentioned in the below table identified in their Participant Consent Form that they may be quoted and named. Transcripts of the interviews were returned to the participants with a release form. All transcripts were released with the exception of Josh Taron, from who no interview data was used.

Aaron Goodarzi	Chair of the Board and Research Lead, Evict Radon Associate Professor, Department of Biochemistry & Molecular Biology, University of Calgary	June 4, 2020
Deepti Biljani	Senior Radon Project Manager, Health Canada	June 11, 2020
Weston Jacques	Executive Director, Evict Radon	June 12, 2020
Katelyn Penstone	Policy Analyst, Health Canada	June 15, 2020
Kelley Bush	Section Head - Radon Education, Health Canada	June 25, 2020
Josh Taron	Board of Directors, Evict Radon Associate Professor, Associate Dean (Research & Int'l), School of Architecture Planning and Landscape, University of Calgary	June 10, 2020

Appendix C – Participant Consent Form



Participant Consent Form

You are invited to participate in a research study entitled: The Influence of Public and Media Attention on Policy: Applying the Issue-Attention Cycle to Radon in Canada

Student Researcher(s): Michaela Neetz, Masters of Public Policy Student, Johnson-Shoyama Graduate School, University of Saskatchewan, michaela.neetz@usask.ca

Supervisor: Jeremy Rayner, Professor and Graduate Chair, Johnson Shoyama Graduate School of Public Policy, University of Saskatchewan, (306)-966-2215, jeremy.rayner@usask.ca

Purpose and Objective of the Research:

This research will examine the relationship between public, media, and policy attention to the issue of radon in Canada. The issue-attention cycle is a concept which describes how certain issues rise quickly in public attention before slowly deescalating and returning to some new level of sustained attention. This concept will be applied to describe and examine the influence public, media, and policy attention have upon each other. In addition to exploring the issue of radon, this research will also contribute in the following ways:

- Apply widely accepted concepts and agenda setting theories to the Canadian context
- Explore the use of the issue-attention cycle as a means to map the opening and closing of a policy window, that is to examine times of heightened attention as opportunities when policy change is possible

Procedures:

- The interview which you have been asked to participate in will be semi-structured meaning the questions will be guided by themes but remain open-ended for more discussion. Semi-structured interview questions are both specific and flexible, allowing for the conversation to be directed toward the topics and issues of interest, which for this research is attention to the issue of radon.
- Initial public and media data have been collected. This includes a review of newspaper articles from the Factiva database and Google Trends data. Events of high media and public attention have been identified and initial results will be shared with you for discussion at the time of the interview.
- A copy of the interview questions will be sent to you at least 24 hours before the interview is scheduled for your review.

- The interview will be conducted by telephone or skype call. An audio recording will be taken at the time of the interview. At any time, you may request that the recording be turned off without any given reason.
- The interview will take an estimated 1 hour. It is expected that this will be sufficient to cover all of the interview questions in enough detail. If deemed necessary, a second follow-up email will be scheduled. The expected maximum number on interviews is 2.
- After your interview, and prior to the data being included in the final report, you will be given the opportunity to review the transcript of your interview, and to add, alter, or delete information from the transcript as you see fit. A deadline of two weeks after the return of the transcript will be set for the edits and alterations. A reminder of this deadline will be sent after one week. If no edits are received by the deadline the transcript will be used as is, however you may contact the researcher at anytime if you have concerns.
- The researcher will transcribe the interview notes.
- Please feel free to ask any questions regarding the procedures and goals of the study or your role.

Funded by:

- CANDU Owners Group Inc. (COG)

Potential Risks:

- There is minimal anticipated risks to you by participating in this research.
- The group of policy makers involved with the health impacts of radon exposure in Canada is small. Even if you choose to be interviewed in confidence it is possible that interview material used in research publications could be attributed to you on the basis of internal evidence. This may pose reputational risk.

Potential Benefits:

- This research may help those concerned with raising radon awareness by explaining the causes of the issue-attention cycle, that is the rapid rise and slow de-escalation of attention to an issue.

Confidentiality:

- This data will be disseminated in a thesis and may also contribute to an article. The data will be used in 2 ways. The first is in the writing of the radon policy narrative of Canada, that is what has happened and why did it happen. The second is in supporting to the previously collected policy attention data measured from written policy documents.
- At your discretion, you may request to be interviewed in confidence, in which case your name and position will not be mentioned in the published research papers. Because the participants for this research project have been selected from a small group of people, all of whom are known to each other, it is possible that you may be identifiable to other people on the basis of what you have said. Anonymity cannot be guaranteed in this research.

Please only select one option below:

I wish for my identity to be confidential (not guaranteed)	
I wish for my identity to be confidential but you may refer to me by a pseudonym. The pseudonym I choose for myself is: _____	
You may quote me and use my name	
I would like to be acknowledged for contributing to the research	

Storage of Data:

- Electronic data will be securely stored on the USask OneDrive which is password protected. During analysis a copy of this data will be downloaded on to the researcher's password protected laptop. Upon completion of analysis the updated version of data will be placed on the USask OneDrive and deleted from the researcher's laptop.
- The data will be stored on the USask OneDrive, in accordance with USask policies, for a minimum period of five years post-publication.

Right to Withdraw:

- Your participation is voluntary, and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort.
- Should you wish to withdraw, please contact the researcher by email at Michaela.Neetz@usask.ca. Data will then be deleted from the research and destroyed.
- Your right to withdraw data from the study will apply until June 1st, 2020. After this, it is possible that some form of research dissemination will have already occurred, and it may not be possible to withdraw your data.

Follow up:

- Upon completion of the thesis and related articles, a summary of the results will be forwarded to you.
- If you wish to receive full copies you may request them from the researcher, please email Michaela.Neetz@usask.ca.

Questions or Concerns:

- Contact the researcher(s) using the information at the top of page 1.
- This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out of town participants may call toll free 1-888-966-2975.

Consent:

Continued or On-going Consent:

- In the event of a follow-up interview, we will revisit this consent form. An initial and date will be required before commencing the follow-up interview.

Signed Consent:

Your signature below indicates that you have read and understand the description provided. I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project. A copy of this consent form has been given to me for my records.

Name of Participant

Signature

Date

Researcher's Signature

Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Oral Consent:

I read and explained this consent form to the participant before receiving the participant's consent, and the participant had knowledge of its contents and appeared to understand it.

Name of Participant

Researcher's Signature

Date