

Assessing general public and policy influencer support for healthy public policies to promote healthy eating at the population level in two Canadian provinces

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Abstract

Objective: To assess and compare the favourability of healthy public policy options to promote healthy eating from the perspective of members of the general public and policy influencers in two Canadian provinces.

Design: The Chronic Disease Prevention Survey, administered in 2016, required participants to rank their level of support for different evidence-based policy options to promote healthy eating at the population level. Pearson's χ^2 significance testing was used to compare support between groups for each policy option and results were interpreted using the Nuffield Council on Bioethics' intervention ladder framework.

Setting: Alberta and Québec, Canada.

Participants: Members of the general public (n 2400) and policy influencers (n 302) in Alberta and Québec.

Results: General public and policy influencer survey respondents were more supportive of healthy eating policies if they were less intrusive on individual autonomy. However, in comparing levels of support between groups, we found policy influencers indicated significantly stronger support overall for healthy eating policy options. We also found that policy influencers in Québec tended to show more support for more restrictive policy options than their counterparts from Alberta.

Conclusions: These results suggest that additional knowledge brokering may be required to increase support for more intrusive yet impactful evidence-based policy interventions; and that the overall lower levels of support among members of the public may impede policy influencers from taking action on policies to promote healthy eating.

Keywords
Healthy public policy
Chronic disease prevention
Healthy eating
Survey
Nuffield intervention ladder
Canada

In Canada, it is reported that approximately 29% of the population aged 20 years or older has been diagnosed with at least one major chronic disease (e.g. cancer, CVD, diabetes, chronic respiratory disease, and mood and anxiety disorders)⁽¹⁾. Unhealthy diets, which include the excess consumption of energy-dense foods high in *trans*-fatty acids, saturated fats, salt and/or free sugars, contribute to the development of chronic disease including diabetes and obesity⁽²⁾. In particular, high levels of free sugars in foods and beverages are a major source of excessive energy consumption particularly in children, adolescents and young adults⁽²⁾. In Canada for example, it is estimated that 16% of children and adolescents drink

sugar-sweetened beverages every day⁽¹⁾. Not only do unhealthy diets impact overall health status, they also have serious implications for the economy. It is estimated that the total annual economic burden of unhealthy eating in Canada is \$CAN 6.6 billion, which includes direct health-care costs⁽³⁾. Most commonly, interventions to target healthy eating, improve health and reduce the burden on the economy have focused primarily on individual-level determinants⁽⁴⁾ such as nutrition knowledge. While individual-level determinants play a role in healthy eating, individual factors are unable to fully explain a person's eating behaviours⁽⁵⁾. For this reason, it is important to consider other factors that are found to play a role in

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determining healthy eating such as environment-level determinants (i.e. the context for eating behaviours) and policy determinants (i.e. that shape supportive environments to promote healthy eating)⁽⁵⁾.

Swinburn *et al.* characterized food environments as consisting of the 'physical, economic, policy and socio-cultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status'⁽⁶⁾ (p. 25). Consequently, food environments can influence the consumption of unhealthy diets⁽⁶⁾, and the subsequent development of chronic disease, through inexpensive access to foods and beverages that are energy-dense, nutrient-poor and vigorously promoted⁽⁷⁾. Research suggests that national governments and the global food industry have the greatest ability to influence our food environments and impact population-level healthy eating⁽⁶⁾. For example, while global food industries largely operate on market principles, they do so in the context of regulations and laws dictated primarily by national governments⁽⁶⁾. When market principles fail to promote ideal health conditions at the population level, governments have the capacity to improve food environments and promote healthy eating through public policy intervention⁽⁶⁾.

National-level policy actors are one layer of influence on our food environments. From an ecological perspective, policy influencers at various levels and settings within the ecological model (i.e. organizational and institutional settings such as workplaces, schools and recreational facilities) have the capacity to directly impact healthy eating through policy intervention within their respective settings. For example, elected officials at the provincial level have the decision-making ability to influence healthy eating through fiscal policies, such as subsidies on healthy foods. Similarly, municipal councillors can impact access to healthy food options at public recreation facilities through policy action. Interestingly, while policy influencers ultimately hold decision-making power on policy action to promote healthy eating, there is a paucity of evidence illuminating the extent to which this group supports relevant policy action. Further yet, as many policy influencers hold an elected position and are accountable to their constituents, it is also essential to better understand public support for policies to promote healthy eating.

There is a growing evidence base for public support for nutrition-relevant healthy public policies. For instance: Morley *et al.*⁽⁸⁾ summarized responses among Australians by socio-economic and parental status; Pollard *et al.*⁽⁹⁾ examined Australians' responses in terms of socio-demographic characteristics, BMI, cooking skills and attitudes; Beeken and Wardle⁽¹⁰⁾ characterized responses in relation to aetiological attributions for obesity in Great Britain; and Mazzocchi *et al.*⁽¹¹⁾ analysed responses across Europe by sociodemographic characteristics, lifestyle, attitudes and national origin variables. However, there is a

paucity of research exploring the opinions of policy influencers specifically, and further, comparing such levels of support with opinions expressed by the general public.

To address these gaps in knowledge, the aim of our study was to assess both general public and policy influencer support for public policies to promote healthy eating at the population level in Alberta and Québec, Canada. First, we administered the Chronic Disease Prevention Survey⁽¹²⁾ in the summer of 2016. The aim of the survey, initially developed in 2009, was to assess the knowledge, attitudes and beliefs of members of the general public and policy influencers on chronic disease prevention from a health promotion lens with respect to four key modifiable risk factors (i.e. unhealthy eating, physical inactivity, tobacco use and alcohol consumption). Second, we applied the Nuffield Council on Bioethics' intervention ladder framework⁽¹³⁾ (referred to as the 'Nuffield intervention ladder' hereafter) as a means to empirically categorize the different policy options to promote healthy eating presented in the survey according to intervention type and level of intrusiveness.

The focus on 'acceptability' or support for policies to promote healthy eating is important to unravel in the context of liberal democratic states like Canada⁽¹⁴⁾ where emphasis is placed on choice and autonomy⁽¹³⁾. As a consequence, an important factor in developing healthy public policy is to find a balance between choice and autonomy of individuals with the need to support people who lack the opportunity to choose (e.g. due to poverty)⁽¹³⁾. To better understand this balance, tools like the Nuffield intervention ladder have been developed to understand the different factors that influence the acceptability of different public policies⁽¹³⁾. The Nuffield intervention ladder is a useful ethical framework for policy influencers, health practitioners and researchers in considering the balance of the benefits of public health intervention with restrictions on individual autonomy⁽¹³⁾. Additionally, from a theoretical lens, this framework permitted us to engage with emerging ideas on the public health ethics surrounding policy influencer and general public support for policy interventions to improve population health *v.* preserving individual autonomy.

Methods

The Chronic Disease Prevention Survey

In 2016, we administered the full cross-sectional Chronic Disease Prevention Survey to a sample of policy influencers and members of the general public in Alberta and Québec. This survey was first developed and tested in 2009 and subsequently administered in 2010, 2011, 2014 and 2016⁽¹²⁾. The Chronic Disease Prevention Survey aims to understand the knowledge, attitudes and beliefs around healthy public policy for population-level chronic disease prevention related to four major modifiable risk factors

(i.e. unhealthy eating, physical inactivity, tobacco use and excessive alcohol consumption). The full survey is comprised of six sections which include: (i) views on the causes of chronic diseases; (ii) perspectives on health promotion; (iii) responsibility for programmatic and policy action; (iv) policy approaches; (v) understanding the provincial/territorial environment; and (vi) demographics. Previous iterations of the survey have included a descriptive baseline summary of perceptions of policy influencers⁽¹⁵⁾, an exploratory factor analysis comparing support between policy influencers and the general population⁽¹⁶⁾ and a social network analysis⁽¹⁷⁾. The present analysis makes a unique contribution to the literature in a number of ways. First, it focuses on the most recent survey iteration exploring support for evidence-based healthy public policy approaches to promote healthy eating from the perspective of both policy influencers and the general population. Few studies to date have explored both perspectives simultaneously. Second, the analysis contextualizes levels of support from the lens of impact on autonomy using the Nuffield intervention ladder framework.

Participants and sampling

Members of the general public from both provinces were recruited by telephone, based on a stratified random digit dialling sampling strategy. As part of this stratified sampling method, general public respondents were chosen to mirror a set proportion of urban *v.* rural residents, an equal distribution of gender, as well as the age demographics reflected in both provinces. Similarly, policy influencers were recruited to take part in an online survey distributed via email based on a sampling frame strategy in both provinces that aimed to comprehensively include all policy influencers that met our definition. For sampling purposes, we defined policy influencers as all provincial Members of Legislative Assembly in Alberta and National Assembly in Québec, deputy ministers at any rank, senior executives in workplaces with more than 500 employees, Mayors and Reeves, senior administrative officials in municipal settlements, school board trustees, print media editors and health reporters^(15–17). This comprehensive definition of policy influencers was used as it covers three key domains of influence: (i) municipal and provincial government actors based on their decision-making authority; (ii) non-governmental leaders within workplace and school environments, given the effectiveness of policies to improve health outcomes in these key settings⁽¹⁸⁾; and (iii) finally the media was included based on the influential role of policy narratives in shaping public opinion and legislative agendas⁽¹⁹⁾.

While it has been demonstrated that achieving higher response rates does not necessarily alter the nature of responses received^(20,21), we aimed to address any potential for non-response and/or selection bias in both

the policy influencer and public groups by ensuring we obtained the largest sample size possible using repeated follow-ups via telephone calls and emails within our respective sampling frames. Further, an overlap between sample groups was unlikely as the sampling frame was less than 0.001 % of the total population of either province. However, if overlap did occur, policy influencers were asked to respond to the survey from their perspective within their organizations. As such, they were free to respond as private citizens as well and had the right to refuse participation in either survey.

Data collection

Survey respondents from both sample groups were asked to rank their support for each evidence-based healthy public policy option specific to promoting healthy eating on a four-point Likert-style scale which measured support *v.* opposition (i.e. 1 = 'strongly oppose', 2 = 'oppose', 3 = 'support', 4 = 'strongly support'). We purposefully used a four-point scale to support the Pearson χ^2 significance testing in our analysis which requires a binary variable (e.g. support/oppose). In total, thirteen questions specific to policies promoting healthy eating were asked of both policy influencers and the general public (see Table 2 for the list of policy options). In addition, policy influencers were asked to indicate their level of support for an additional twenty policy options on healthy eating on a broader range of policy approaches (see Table 4). We opted for a smaller subset of the survey for members of the general public to minimize respondent fatigue. Reminder invitations to policy influencers were sent each week following the initial invitation for a total of six weeks for the complete survey.

Survey analysis

We created a binary variable for 'support' (combining 'strongly support' with 'somewhat support' responses) *v.* 'opposition' (combining 'strongly oppose' with 'somewhat oppose' responses) in order to conduct Pearson's χ^2 significance testing at the $\alpha=0.05$ level for potential differences in proportions of responses among the policy influencers *v.* the general public (Table 2). We conducted this same analysis comparing policy influencer and general public responses by region (Table 3), comparing Alberta and Québec separately. In addition, we conducted the same procedure of significance testing for proportions of responses among policy influencers between Alberta and Québec for the additional twenty policy options asked of just policy influencers.

Next, each of the healthy eating policy options was coded according to the highly cited Nuffield intervention ladder⁽¹³⁾. The Nuffield intervention ladder helped us to categorize public health policies according to level of intrusiveness to individual autonomy. This framework consists of eight levels ranging from least to most intrusive,

including: 0 = 'do nothing or simply monitor the situation'; 1 = 'provide information'; 2 = 'enable choice'; 3 = 'guide choices through changing the default policy'; 4 = 'guide choices through incentives'; 5 = 'guide choices through disincentives'; 6 = 'restrict choice'; and 7 = 'eliminate choice'⁽¹³⁾. To reduce bias in the coding process, three research assistants independently coded each of the policy options using a codebook developed by the research team⁽²²⁾. While other studies that have used the Nuffield intervention ladder have condensed the levels of the ladder into broader categories^(23,24), we felt it was important to maintain the nuance of each level in the coding process. While there was agreement among the research assistants for the majority of coded policy options, a fourth senior research analyst was brought in to reach consensus among the research team in areas where there was disagreement.

Results

In total, 302 policy influencers participated in the online survey (174 from Alberta and 128 from Québec) and 2400 members of the general public responded to the telephone survey (1200 participants each from both Alberta and Québec). The response rate for the survey among policy influencers and the public, respectively, was 10.2

and 8.0 % in Alberta and 3.0 and 6.0 % in Québec. Missing survey data for policy influencers ranged from 18.2 to 48.0 %, while for the general public missing survey data ranged from 0.3 to 1.7 %. The response rates for our 2016 survey are comparable to previous iterations^(15,16). The demographic characteristics of each sample group, by province, are presented in Table 1. The majority of policy influencers from both provinces were male and over the age of 45 years. For both provinces, policy influencers were most commonly in a hired or elected position. A higher percentage of policy influencers in Alberta identified as having a 'conservative' political ideology compared with policy influencers in Québec (38.8 and 12.4 %, respectively). The older age and male skew of policy influencer respondents reflects the demographic profile of policy leaders in Canada, more generally^(25,26). Public respondents were sampled to reflect the demographic characteristics of each province. Among general public respondents, the percentage of respondents with a household income equal to or greater than \$CAN 70 000 was higher in Alberta than Québec (63.4 and 47.2 %, respectively). The socio-economic profile found among survey participants in both provinces is consistent with 2016 Canadian Census median household income findings (i.e. \$CAN 93 835 and \$CAN 59 822 in Alberta and Québec, respectively)⁽²⁷⁾.

Table 1 Demographics of policy influencer and general public respondent samples from the 2016 Chronic Disease Prevention Survey in the provinces of Alberta and Québec, Canada (valid percentages and numbers of respondents)

	Alberta				Québec			
	Public		Policy influencer		Public		Policy influencer	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Gender								
Male	49.2	591	70.9	107	46.7	560	67.6	73
Female	50.8	609	29.1	44	53.3	640	32.4	35
Age (years)								
18–45	32.9	390	9.6	15	34.8	415	25.7	28
≥46	67.1	797	90.4	141	65.2	776	75.3	81
Household income								
<\$CAN 70 000	36.6	383	–	–	52.8	564	–	–
≥CAN \$70 000	63.4	663	–	–	47.2	504	–	–
Education								
Up to post-secondary	20.5	244	–	–	18.8	224	–	–
Post-secondary	79.5	944	–	–	81.2	966	–	–
Political ideology								
Liberal	–	–	36.3	57	–	–	41.0	43
Neutral	–	–	24.8	39	–	–	46.7	49
Conservative	–	–	38.8	61	–	–	12.4	13
Sector								
Provincial government	–	–	19.2	30	–	–	10.2	11
Municipal authority	–	–	24.4	38	–	–	55.6	60
Workplace	–	–	23.1	36	–	–	24.1	26
School board	–	–	14.7	23	–	–	3.7	4
Media	–	–	6.4	10	–	–	2.8	3
Other	–	–	12.2	19	–	–	3.1	4
Nature of position								
Elected	–	–	24.5	39	–	–	31.8	35
Appointed	–	–	11.3	18	–	–	11.8	13
Hired	–	–	61.6	98	–	–	51.8	57
Other	–	–	2.5	4	–	–	3.9	5

In total, thirteen healthy eating policy options were asked of both policy influencers and members of the general public in Alberta and Québec (see Tables 2 and 3). The majority of policy options asked of both groups were categorized as 'restrict choice' (six of thirteen). The remaining policy options were fairly evenly split across intervention ladder categories.

Policy influencers and the general public in both provinces demonstrated the highest percentage of support for 'providing programmes to educate the general public about how to make healthy food choices', a policy coded as 'provide information' (98.0 and 96.1%, respectively). Similarly, both policy influencers and the general public had the lowest percentage of support for 'restricting or banning new fast-food restaurant drive-through facilities', a 'restrict choice' category (57.5 and 45.8%, respectively). However, in this latter example, members of the general public were significantly less supportive than policy influencers when it came to banning or restricting new drive-through facilities ($P < 0.001$). In comparing levels of support between policy influencers and members of the general public in both regions, we found that these groups

had significantly different levels of support for nine of the thirteen healthy eating policy options asked of both groups. For the majority of differences (eight out of nine), policy influencers indicated stronger support for healthy eating policies compared with members of the general public. Notably, policy influencers were significantly more supportive ($P < 0.001$) of taxing the purchase of unhealthy foods and beverages than the public (84.6 *v.* 66.4%, respectively), a 'guide choice through disincentives' policy. Similarly, policy influencers were also significantly more supportive ($P < 0.001$) of restricting sugary drink sales in all public buildings (81.2 *v.* 63.3%, respectively), a 'restrict choice' policy.

Comparing levels of support between policy influencers and the public within each province (Table 3), we identified some notable differences. First, we found that policy influencers and members of the public in Alberta had significantly different levels of support for the majority of healthy eating policy options (nine out of thirteen). In contrast, both policy influencers and members of the public in Québec had similar levels of support for the majority of policy options (eight out of thirteen). Second,

Table 2 Differences in overall levels of support (responded 'strongly support' or 'somewhat support') between policy influencers and members of the general public for healthy eating policy options from the 2016 Chronic Disease Prevention Survey in the provinces of Alberta and Québec, Canada (valid percentages and numbers of respondents)

Policy option	Nuffield invention ladder	Levels of support in both regions								P value*
		Policy influencer (n 302)				General public (n 2400)				
		Support		Missing		Support		Missing		
		%	n	%	n	%	n	%	n	
Provide programmes to educate the general public about how to make healthy food choices	1. Provide information	98.0	199	32.8	99	96.1	2300	0.3	6	0.160
Fund government media campaigns that encourage healthy food and beverage choices	1. Provide information	95.0	207	27.8	84	87.7	2085	0.9	22	0.001*
Ensure breast-feeding is permitted and adequate facilities exist in all public buildings	2. Enable choice	89.5	170	37.1	112	95.9	2273	1.3	30	<0.001*
Mandate priority space for healthy foods and beverages in all recreation facilities	2. Enable choice	88.3	189	29.1	88	89.8	2136	0.9	21	0.499
Subsidize the purchase of healthy foods and beverages	4. Guide choices through incentives	77.5	176	24.8	75	79.5	1885	1.2	29	0.484
Tax the purchase of unhealthy foods and beverages	5. Guide choice through disincentives	84.6	192	24.8	75	66.4	1576	1.0	25	<0.001*
Tax sugary drinks and energy drinks on top of sales taxes	5. Guide choice through disincentives	80.1	177	26.8	81	66.3	1581	0.7	17	<0.001*
Restrict sugary drink sales in all public buildings	6. Restrict choice	81.2	190	22.5	68	63.3	1510	0.6	15	<0.001*
Restrict unhealthy food sales in all recreation facilities	6. Restrict choice	78.4	185	21.9	66	69.0	1648	0.4	10	0.003*
Restrict sugary drink sales in all recreation facilities	6. Restrict choice	78.2	183	22.5	68	67.2	1607	0.4	9	0.001*
Permit zoning to restrict the supply of junk food near schools	6. Restrict choice	76.6	177	23.5	71	76.2	1820	0.5	13	0.898
Permit zoning to limit the number of fast-food restaurants per square kilometre	6. Restrict choice	70.8	170	20.5	62	64.3	1518	1.7	41	0.045*
Restrict or ban new fast-food restaurant drive-through facilities	6. Restrict choice	57.5	142	18.2	55	45.8	1082	1.6	39	<0.001*

*Pearson χ^2 test of asymptotic significance (two-sided) at the $\alpha = 0.05$ level.

Table 3 Differences in levels of support (responded 'strongly support' or 'somewhat support') by region between policy influencers and members of the general public for healthy eating policy options from the 2016 Chronic Disease Prevention Survey in the provinces of Alberta and Québec, Canada (valid percentages and numbers of respondents)

		Levels of support by region																	
		Alberta										Québec							
		Policy influencer (<i>n</i> 174)				General public (<i>n</i> 1200)						Policy influencer (<i>n</i> 128)				General public (<i>n</i> 1200)			
		Support		Missing		Support		Missing		<i>P</i> value*		Support		Missing		Support		Missing	
Policy option	Nuffield invention ladder	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	<i>P</i> value*	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	<i>P</i> value*
Provide programmes to educate the general public about how to make healthy food choices	1. Provide information	97.9	94	44.8	78	93.9	1122	0.4	5	0.105	98.1	105	16.4	21	98.2	1178	0.1	1	0.929
Fund government media campaigns that encourage healthy food and beverage choices	1. Provide information	93.6	103	36.8	64	84.3	1001	1.0	12	0.008*	96.3	104	15.6	20	91.1	1084	0.8	10	0.063
Ensure breast-feeding is permitted and adequate facilities exist in all public buildings	2. Enable choice	87.1	74	51.1	89	94.7	1117	1.7	20	0.004*	91.4	96	18.0	23	97.1	1156	0.8	10	0.002*
Mandate priority space for healthy foods and beverages in all recreation facilities	2. Enable choice	84.3	91	37.9	66	86.4	1031	0.6	7	0.532	92.5	98	17.2	22	93.2	1105	1.2	14	0.780
Subsidize the purchase of healthy foods and beverages	4. Guide choices through incentives	82.1	101	29.3	51	76.5	906	1.3	15	0.156	72.1	75	18.8	24	82.5	979	1.2	14	0.008*
Tax the purchase of unhealthy foods and beverages	5. Guide choice through disincentives	82.8	101	29.9	52	56.9	677	0.8	10	<0.001*	86.7	91	18.0	23	75.9	899	1.3	15	0.012*
Tax sugary drinks and energy drinks on top of sales taxes	5. Guide choice through disincentives	75.6	90	31.6	55	58.2	694	0.7	8	<0.001*	85.3	87	20.3	26	74.5	887	0.8	9	0.015*
Restrict sugary drink sales in all public buildings	6. Restrict choice	80.3	102	27.0	47	53.8	642	0.6	7	<0.001*	82.2	88	16.4	21	72.8	868	0.7	8	0.034*
Restrict unhealthy food sales in all recreation facilities	6. Restrict choice	79.5	101	27.0	47	60.9	728	0.4	5	<0.001*	77.1	84	14.8	19	77.0	920	0.4	5	0.985
Restrict sugary drink sales in all recreation facilities	6. Restrict choice	80.3	102	27.0	47	53.8	698	0.3	3	<0.001*	75.7	81	16.4	21	76.1	909	0.5	6	0.920
Permit zoning to restrict the supply of junk food near schools	6. Restrict choice	70.1	89	27.0	47	68.8	821	0.6	7	0.770	84.6	88	18.8	24	83.7	999	0.5	6	0.802
Permit zoning to limit the number of fast-food restaurants per square kilometre	6. Restrict choice	71.3	97	21.8	38	57.7	683	1.3	16	0.002*	70.2	73	18.8	24	71.1	835	2.1	25	0.851
Restrict or ban new fast-food restaurant drive-through facilities	6. Restrict choice	58.6	85	16.7	29	38.2	449	2.0	24	<0.001*	55.9	57	20.3	26	53.4	633	1.3	15	0.632

*Pearson χ^2 test of asymptotic significance (two-sided) at the $\alpha=0.05$ level.

although we did not statistically test for 'level of intrusiveness' as a predictor of different levels of support between sample groups, we did observe a few emerging patterns that we believe are valuable to highlight in our findings. For instance, we observed that policy influencers and members of the public in Alberta tended to have more differences in levels of support for policies that 'restricted choice', compared with their counterparts in Québec. For example, members of the public in Alberta had a significantly lower percentage of support for 'restricting sugary drink and unhealthy food sales in all recreation facilities', which is a 'restrict choice' policy, compared with Alberta policy influencers. Conversely, members of the general public and policy influencers in Québec had similar levels of support for 'restrict choice' policies. For example, both 84.6% of policy influencers and 83.7% of the general public in Québec were supportive of 'permitting zoning to restrict the supply of junk food near schools', a 'restrict choice' policy. However, in both these examples we cannot definitively state whether 'level of intrusiveness' played a role in contributing to these differences.

Finally, we also queried policy influencers in Alberta and Québec on an additional twenty healthy eating policy options to provide policy advocates with a richer understanding of perspectives on a range of policies (Table 4). For the majority of policy options to promote healthy eating, policy influencers in Alberta and Québec had similar percentages of support (seventeen out of twenty). As previously stated, while we did not statistically test 'level of intrusiveness' as a predictor of differences, we did observe a pattern of policy influencers tending to show higher support for less intrusive policy options categorized as providing information or enabling choice. We also noted that it appeared policy influencers in Québec tended to be slightly more supportive towards some restrictive policy options compared with their Albertan counterparts. For instance, 90.2% of policy influencers in Québec supported 'banning the use of artificial *trans* fats in all food products' compared with 76.5% of policy influencers in Alberta ($P=0.009$), an 'eliminate choice' policy. Similarly, 94.1% of policy influencers in Québec supported 'eliminating all forms of subsidies that make junk foods cheaper than healthy foods' compared to 85.5% in Alberta ($P=0.057$), a 'guide choice through disincentives' policy. However, such patterns should be considered cautiously as we did not statistically assess whether 'level of intrusiveness' had an impact on these differences.

Discussion

Overall, policy influencers and members of the general public indicated a high percentage of support for less intrusive policies lower on the intervention ladder such as

'providing information' and 'enabling choice' policies. For instance, 'ensuring breast-feeding is permitted and adequate facilities exist in all public buildings', an 'enabling choice' policy, was strongly supported by both policy influencers (89.5%) and members of the general public (95.9%). In contrast, both sample groups demonstrated an overall trend of lower support for more intrusive policies higher on the intervention ladder such as 'restricting choice', a case in point with 'restricting or banning new fast food restaurants drive-through facilities' receiving the lowest support. These results from our survey on the acceptability of public policies to promote healthy eating are fairly consistent with previous findings on this topic. For example, a review by Diepeveen *et al.*⁽²³⁾ found that support for healthy public policy interventions to influence behaviour change was stronger for interventions that were less intrusive (i.e. lower on the Nuffield intervention ladder such as 'providing information'). Diepeveen *et al.*⁽²³⁾ conclude that their findings appear to be consistent with a traditional economic world-view that people are hesitant to support public policies which obstruct their own decision making, as individuals believe they know best what is good for themselves. While public health evidence clearly demonstrates the health impact of acting further upstream⁽²⁸⁾, policy influencers' and the general public's preference for less intrusive policy interventions presents a barrier for action on chronic disease prevention.

Further, when we compared support between policy influencers and members of the general public, we found significantly different levels of support for the majority of policy options asked of both sample groups. Further, in eight out of the nine areas of difference, policy influencers indicated statistically higher support compared with the general public. These findings may have important implications particularly for policy influencers in elected positions. For instance, while policy influencers indicated stronger support for the majority of healthy policy options, their general public counterparts (e.g. constituency members) may impede moving to action on these policy options as they have indicated less support. Although overall differences in public support for healthy public policies are thought to follow a socio-economic gradient such that lower socio-economic status is associated with greater acceptability, there tends not to be a consistent trend for nutritional policy interventions, specifically⁽²³⁾. Lower-income individuals are more likely to be overweight or obese⁽²⁹⁾, but research has shown that they are generally less likely to support increasing taxation or reducing educational and sport sponsorships by the food industry⁽⁸⁾. Arguably, these groups may be opposed to policies that are higher on the intervention ladder because these interventions pose constraints on their already limited household resources and restrict their opportunities for attaining a higher standard of living.

Table 4 Differences in levels of support (responded 'strongly support' or 'somewhat support') by region between policy influencers for additional healthy eating policy options from the 2016 Chronic Disease Prevention Survey in the provinces of Alberta and Québec, Canada (valid percentage and number of respondents)

		Levels of support among policy influencers								<i>P</i> value*
		Alberta (<i>n</i> 174)				Québec (<i>n</i> 128)				
		Support		Missing		Support		Missing		
		%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
Policy option	Nuffield intervention ladder	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
Mandate government-led front-of-package nutrition labelling on all processed foods and beverages	1. Provide information	90.5	95	39.7	69	92.2	95	19.5	25	0.652
Mandate energy listing on all restaurant menus	1. Provide information	84.0	89	41.4	72	87.3	89	17.2	22	0.499
Provide comprehensive nutrition education in schools (including pre-schools)	2. Enable choice	92.6	50	69.0	120	98.1	101	19.5	25	0.090
Involve students to grow and prepare nutritious foods and beverages in schools (including pre-schools)	2. Enable choice	91.5	65	59.2	103	99.0	103	18.8	24	0.013*
Mandate government-led logos or symbols in grocery stores to help identify healthy foods and beverages	2. Enable choice	93.0	93	42.5	74	89.6	95	17.2	22	0.391
Foster relationships between schools (including pre-schools) and local food and beverage producers	2. Enable choice	86.5	83	44.8	78	95.3	102	16.4	21	0.026*
Provide fruit and vegetable subscription programmes for schools (including pre-schools)	2. Enable choice	84.6	66	55.2	96	92.5	99	16.4	21	0.087
Adopt and implement an evidence-based food and beverage rating system for meals and snacks consumed by children	2. Enable choice	89.1	90	42.0	73	86.5	83	25.0	32	0.570
Mandate priority space for healthy foods and beverages in all public buildings	2. Enable choice	84.5	98	33.3	58	89.6	95	17.2	22	0.256
Permit zoning to increase the number of small grocery stores that people can walk to in every neighbourhood	2. Enable choice	82.8	96	33.3	58	88.3	91	19.5	25	0.242
Ensure sufficient social assistance food allowances for recipients to purchase a nutritious food basket	2. Enable choice	87.3	89	41.4	72	81.0	85	18.0	23	0.216
Mandate priority space in grocery stores for healthy foods and beverages (e.g. no candy 'powerwalls' in checkout aisles)	2. Enable choice	82.6	90	37.4	65	80.0	84	18.0	23	0.630
Provide incentives to diversify concentrated ownership in the food industry	2. Enable choice	66.4	85	26.4	46	72.1	62	32.8	42	0.379
Monitor and evaluate school (including pre-school) food and beverage initiatives	3. Guide choices through changing the default policy	86.4	95	36.8	64	90.2	92	20.3	26	0.387
Remove sales taxes on pre-cut vegetables and fruits in grocery stores	4. Guide choices through incentives	89.7	61	60.9	106	91.3	94	19.5	25	0.117
Eliminate all forms of subsidies that make junk foods cheaper than healthy foods	5. Guide choices through disincentives	85.5	65	56.3	98	94.1	95	21.1	27	0.057
Restrict unhealthy foods sales in all public buildings	6. Restrict choice	80.0	104	25.3	44	79.2	84	17.2	22	0.886
Regulate portion sizes in pre-packaged unhealthy foods and beverages	6. Restrict choice	74.8	92	29.3	51	74.7	74	22.7	29	0.993
Regulate portion sizes in food outlets	6. Restrict choice	69.2	90	25.3	44	62.3	66	17.2	22	0.261
Ban the use of artificial <i>trans</i> fats in all food products	7. Eliminate choice	76.5	75	43.7	76	90.2	92	20.3	26	0.009*

*Pearson χ^2 test of asymptotic significance (two-sided) at the $\alpha=0.05$ level.

Illuminating these potential barriers has value in terms of focusing advocacy efforts. For instance, our findings highlight the need for health advocates to: (i) build support for upstream policy and environmental interventions; and (ii) target awareness-raising efforts among members of the general public to support policy influencers in elected positions to take action on healthy eating policies. There are strong examples of health advocacy groups in both provinces focused on advancing healthy eating policies among both policy influencers and the general public that may find these observations valuable. In Alberta, the Alberta Policy Coalition for Chronic Disease Prevention (APCCP), a non-profit collection of seventeen governmental and non-governmental organizations dedicated to improving population health in Alberta, has been working to advance healthy eating policy in the province since 2009⁽³⁰⁾. Examples of the APCCP's work in this area include: convening priority-setting consensus conferences with provincial leadership on restricting unhealthy food and beverage marketing to children⁽³¹⁾; mandating front-of-package, shelf and menu labelling⁽³²⁾; and promoting healthy food procurement in public facilities⁽³³⁾. General awareness and willingness to support healthy eating policy is promoted through the collective and synergistic efforts of nutritionally focused APCCP organizations – including Alberta Health Services, Dietitians of Canada, EverActive Schools, the Centre for Health and Nutrition at the University of Alberta School of Public Health, and the Growing Food Security in Alberta Network – who cultivate public support through various initiatives, including scheduled news releases, hosting conferences and forums, sponsoring farmers' markets and seed exchange events, and operating numerous programmes in comprehensive school health⁽³⁴⁾. In Québec, the Coalition Poids, or the Weight Coalition, has been a leader since 2006 in advocating for legislation, regulations and public policy to promote the development of healthy environments to support healthy lifestyles⁽³⁵⁾. The Coalition Poids has developed a number of tools to contribute to discussions and build support for healthy schools and cities, among others⁽³⁵⁾. Other organizations in Québec promoting healthy eating include the Association pour la Santé Publique du Québec (ASPQ), or the Public Health Association of Québec⁽³⁶⁾. Organizations including the ASPQ have similarly played an influential role in raising awareness among the general public and advocating for healthy eating policies through a variety of strategies including press releases, videos and publications⁽³⁶⁾.

Finally, our results also highlight a few differences in attitudes towards healthy eating policies in Alberta and Québec. For instance, we found emerging patterns of differing levels of support among policy influencers in Alberta and Québec when it came to policies that were more restrictive. For instance, policy influencers in Québec indicated stronger support for 'banning the use of artificial *trans* fats in all food products' ($P=0.009$)

compared with policy influencers in Alberta (see Table 4). Further, when comparing levels of support between policy influencers and members of the public within each province, we also found that there were more areas of differing levels of support between sample groups in Alberta compared with Québec. While it is not statistically clear whether 'level of intrusiveness' was a key factor in influencing levels of support for healthy public policies to promote healthy eating between provinces and sample groups, we do think it is valuable to draw attention to the influence of political context in each region and the potential impact on attitudes for healthy eating policies.

Indeed, a higher percentage of policy influencer respondents in our survey from Alberta identified with holding a conservative political ideology compared with their counterparts in Québec (38.8 *v.* 12.4%). It is important to consider the different political climates in Alberta and Québec as an influencing factor. Since the 1990s and up until 2015, political scientists have described Alberta as a neoliberal democratic one-party state governed by a conservative political party⁽³⁷⁾. Readers may be surprised to learn that until 2015, electorally speaking, the Progressive Conservatives in Alberta held power for 40 years⁽³⁸⁾. This neoliberal climate, which 'emphasizes personal initiative and private sector solutions, while downplaying the importance of politics'⁽³⁷⁾ (p. 274), may in part explain why there is possibly less support for policies that involve more intrusive state intervention. In contrast, Québec has a stronger history of state intervention through spending and taxation; for example, during the Quiet Revolution, 'Québec's state developed an extensive capacity for economic intervention'⁽³⁹⁾ (p. 53) which continues to play a role in the current political environment. The more 'coordinated market economy' found in Québec⁽³⁹⁾ may explain a potential pattern of stronger support for more intrusive (e.g. fiscal) interventions to promote healthy eating. Additional analysis is needed to more definitively assert these conclusions.

Strengths and limitations

Nevertheless, the interpretations we have presented in the current study should be viewed cautiously given the relatively small sample size of respondent groups and the percentage of missing data among policy influencer respondents. While our sample size is comparable in scope to similar studies of this nature⁽⁴⁰⁾, and consistent with the overall trend in North American household survey research⁽⁴¹⁾, it may not be fully representative of the beliefs of members of the general public and policy influencers in Alberta and Québec. Results may also have been biased by a greater number of responses from policy influencers and members of the public who tend to be more supportive of healthy eating policies; hence levels of support may be overestimated.

Despite limitations of sample size, the findings from our study make an important contribution to building the evidence base on support for policies to promote healthy eating at the population level. To the best of our knowledge, the present study is one of the first to compare support for healthy eating policies between policy influencers and members of the public. This information provides health advocates with a better understanding of the context in which advocacy and policy-making efforts are taking place. Although we did not statistically test 'level of intrusiveness' as a predictor of differences in levels of support, we did observe emerging patterns that health advocates in Alberta and Québec should be aware of. These patterns warrant further, detailed exploration in future research. Another strength of our study is the breadth of policy options surveyed among participants on a range of policies options to promote healthy eating. These findings can be used by policy influencers as well as health advocates as a roadmap to take targeted action on chronic disease prevention by identifying areas of existing support. Finally, the invention ladder codebook we developed as a framework to understand support for healthy eating policies based on the impact on individual autonomy will be useful for other researchers looking to code different policies with this framework.

Conclusion

The number of Canadians living with chronic disease continues to increase and has serious negative consequences on quality of life and the economy. Healthy public policies that specifically target healthy eating, a modifiable risk factor, have the potential to positively impact a larger population and reduce the burden of chronic disease. However, it is policy influencers who are the ultimate gatekeepers of healthy public policy. Hence, it is important to understand policy acceptability as one of the various factors that influence the decision-making process. The present study makes an important contribution to the evidence on levels of support for population-level healthy public policies to promote healthy eating among policy influencers and the general public. Based on our findings (and evidence in the wider research literature) we identify a theorized pattern of decreasing policy acceptability with increasing 'level of intrusiveness'. While we do not present a causal interpretation of this pattern, acknowledging the limitations of our study design and sample, we do identify a potential opportunity for health advocacy action. As such, we recommend that health advocates focus some effort on awareness-raising initiatives to increase the policy acceptability of more intrusive (and more effective) upstream determinants of healthy eating. In particular, such efforts should target members of the public to whom policy influencers are accountable as the constituents of their elected positions.

Finally, our findings indicate that regional differences may play a role in influencing support for policy and environmental action to promote healthy eating. Accordingly, health advocates working in local or regional capacities may be best situated to adapt and tailor advocacy efforts, in the light of political history and the current context of decision making.

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