

Classifying the population by socioeconomic factors associated with support for policies to reduce social inequalities in health

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ABSTRACT

Background To examine citizens' agreement with policy options to reduce social inequalities in health and socio-demographic factors associated with support for these policies.

Methods A random digit dialling sample of 16 125 households with access to a landline telephone was conducted in Saskatoon, Canada in 2013. Saskatoon is located in the Canadian prairies and had a population of 222 189 in 2011. A total of 1002 individuals aged 18 or older answered a questionnaire indicating their support for policies to improve health equity. Socio-demographic variables of interest were household income, education, occupation and ethnicity. Latent class analysis and logistic regression analyses were conducted.

Results The latent class analysis showed that 37% of respondents were in the selective agreement group, while 63% were in the high agreement group. The selective agreement group showed lower policy support compared with the high agreement group, in particular for guaranteed annual income, welfare for adults and parents with children, lower tuition for post-secondary students. In the final logistic regression model, socioeconomic factors associated with the likelihood of being in the selective agreement group were: age ≥ 40 years, male, Caucasian ethnicity and higher household income.

Conclusions Residents support for policies to reduce poverty and increase funding for education, creation of health promotion and disease prevention programmes. However, support for these policies is different across social groups.

Keywords health inequality, policy support, public opinion, social determinants of health

Introduction

Public opinion influences public policy, particularly for high profile issues such as health.^{1,2} Several Canadian authors have highlighted the role of citizens in public policy development^{2–5} and the need to draw attention to what individuals think about factors influencing their health.⁶ Simultaneously, the role of social inequalities in health, which were identified >40 years ago when the Lalonde Report was released in Canada,⁷ is recognized as an important determinant of health.^{8–15}

Interventions within and outside the health sector can have an impact on the social determinants of health through changes in policies, laws and norms.¹⁶ Describing what and why citizens think about social inequalities in health is

important in developing policies to reduce them. Studies have examined specific policies that are supported by citizens to improve health.^{5,6,12,13,17} Strategies, such as access to health insurance, improving the physical environment, health practices and reducing poverty were highly supported by Wisconsin adults.¹³ In a Canadian survey, individuals were more supportive of government spending in child care, pharmacare, and dental and vision care, with differences by

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socio-demographic characteristics of participants.⁵ Males and parents with small children were more likely to rank child care as a priority for government spending. In contrast, adults <45 did not rank pharmacare as a priority. Regarding dental care, there were differences in support for this policy based on age, household income, educational level and private health insurance status. Also, variations according to age, household income and education were observed when ranking home care as a priority. Danis *et al.*¹⁷ found that the majority of individuals prioritized access to health insurance, housing vouchers and dental care as important factors for addressing socioeconomic determinants of health. A report prepared by the Canadian Population Health Initiative showed that the majority of participants identified environmental and personal factors as having the greatest impact on health.⁶ Our previous work identified that Saskatoon residents supported tax redistribution as a measure to address health disparities; however, less support was found for redistributing healthcare spending to prevention and education.¹²

Despite studies examining the relationship between public policy and health, relatively little research has examined public support for specific policies to reduce social inequalities in health. Our objective was to examine citizens' agreement with policy options to reduce social inequalities in health. Further, we examined socio-demographic factors associated with agreement to policies aimed at reducing these inequalities.

Methods

Study design and participants

A cross-sectional study was conducted among residents of the city of Saskatoon, Canada. Saskatoon is located in the Canadian prairies and has a population of ~222 000 people.¹⁸

Saskatoon is a relatively conservative city with 2 of 3 federal electoral districts held by the Conservative Party in 2015. Saskatoon and the province of Saskatchewan are experiencing a population and economic boom based on natural resource extraction including potash, oil and uranium.¹⁸ A random sample of 1002 individuals aged over 18 years was obtained between May 1 and May 9, 2013 using a random digit dialling sample of 16 125 households with access to a landline telephone. After obtaining consent, the individual in the household with the next birthday was selected as the respondent. At least five attempts were made to contact each household; no further attempts were made to contact a household if a member of that household refused to participate. The interviews were administered in English by trained interviewers from the Social Sciences Research Laboratories of the University of Saskatchewan. A pilot survey was conducted

with 24 participants on 30 April 2013 to assess the suitability of questions and length of the questionnaire. Ethics approval was obtained from the Behavioural and Biomedical Research Ethics Board of the University of Saskatchewan before conducting the study.

Measures

The Public Health Observatory team of the Saskatoon Health Region designed the socioeconomic policy options questionnaire. The policy options questionnaire was based on previous research conducted in Saskatoon¹² and a review of questionnaires related to social inequalities in health across Canada (Supplementary data, Appendix 1 show the review process).⁹ The policy options generally focus on broad policies to reduce health inequalities, rather than specific health systems approaches such as behaviour change interventions for specific health outcomes. Socio-demographic questions were taken from the census or Canadian Community Health Survey. The questionnaire comprised 26 questions related to people's support for various policies aimed at improving health equity (see Supplementary data, Appendix 2). Respondents could answer 'yes, I would support' a certain policy or 'no, I would not support' this policy. For all questions in the survey respondents could answer 'don't know' or 'refuse'. Questions were grouped into eight types of policies representing poverty reduction, income, children and youth, employment, health care, housing, affordable food, and other options. An example question was: 'Would you support providing a guaranteed annual income (a standard basic yearly income)?' A pilot survey was conducted with 24 participants to assess the suitability of questions and establish the length of the questionnaire. The socio-demographic variables of interest were before tax household income, education, occupation, ethnicity, age and sex.

Analysis

Descriptive statistics were produced for the analysis sample. We computed post-stratification weights by age and sex based on the 2011 Canadian National Household Survey.¹⁹ We applied post-stratification weights by age and sex to the sample for the final regression models. Latent class analysis (LCA) was used to estimate class membership among participants based on their willingness to support policy options to reduce social inequalities in health. LCA is a latent variable model used to identify underlying (unobserved) subgroups in a population.^{20,21} The model posits that each individual belongs to one of a set of mutually exclusive and exhaustive latent classes. Our model assumes that across the 26 policy options there are underlying groups with similar options across all policy options. The model allows us to statistically determine

the number of groups and provides information about the profile of each group with respect to the policy options. This framework is a categorical analogue to factor analysis, which is used to measure continuous latent variables. In LCA, two sets of parameters are estimated: class (group) membership probabilities, which are analogous to factor scores, and item-response probabilities conditional on group membership, which are analogous to factor loadings.

To estimate the association between socio-demographic variables and the probability of belonging to a latent class, logistic regression was conducted using group membership as the dependent variable. We used a forward selection approach and a significance of 0.05 for inclusion of variables into the final model. Adjusted odds ratios and 95% confidence intervals (95% CI) were computed for the final logistic model. Analyses were conducted using R software (Supplementary data, Appendix 3 show R code for complete analysis).

Results

Of the 1002 individuals who participated in the survey, 961 (96%) provided complete responses. Socio-demographic characteristics of participants are presented in Table 1. Of the total participants, the majority were 40 years or older, 69% were females, 91% were Caucasian, 38% had a university education and 46% were retired.

Latent class analysis

We conducted four separate LCAs on the data to determine the optimal number of groups (classes) for the 26 questions. The two-class model had the best fit with a log-likelihood of $-15\,999.47$ and 100% of seeds associated with the best model fit and a Bayesian Information Criterion (BIC) value of $21\,242.4$. The three-, four- and five-class models had log-likelihood values, a per cent of seeds associated with best model fit, and BIC of $-15\,410.77$ (76%; BIC = $20\,613.2$), $-15\,127.77$ (64%; BIC = $20\,413.4$) and $-14\,980.04$ (18%; BIC = $20\,484.2$), respectively. In the final two-class model, 37% of respondents belonged to Class 1, which we describe as the selective agreement group, while 63% of them belonged to Class 2, which we described as the high agreement group. The high agreement group had over 80% agreement with all but four policies, while the selective agreement group had <80% agreement with all policies. Generally, both groups agreed (>50% agreement) with policies to support the reduction of social inequalities in health. However, the probability of support showed for different policies in the selective agreement group was lower than in the high agreement group, especially for policies including a guaranteed annual income, welfare for adults and parents with children, lower

tuition for post-secondary students, creation of more health-care programmes, community groups and social support, and First Nations and Métis determination. In contrast, the high agreement group tended to agree with measures including education, food and health promotion and disease prevention. See Fig. 1 for probabilities of support for each policy stratified by high or selective agreement group.

Comparing support for specific policies between the selective and high agreement groups, both groups agreed with reducing poverty generally (Question 1) and child poverty specifically (Question 2). The groups also tended to disagree with guaranteed annual income (Question 4) and welfare policies (Questions 6 and 7). Regarding education policies, the probability of support in the selective agreement group tended to be lower than the high agreement group. Support for policies to create more healthcare programmes and services showed large differences between the selective and high agreement groups. Furthermore, compared with the high agreement group, low support was shown in the selective agreement group for housing policies, access to more nutritious food, affordable transit, recreational activities and First Nations and Métis self-determination.

Logistic regression using class membership as the outcome

The unadjusted analysis showed that being aged ≥ 40 , sex, ethnicity and income were associated with belonging to the selective agreement group (Table 2). With income only in the model, compared with the lowest income category of less than \$25 000, individuals earning between \$25 000 and \$50 000 (OR = 2.0, 95% CI 1.0–3.8), between \$50 000 and \$75 000 (OR = 1.9, 95% CI 1.0–3.6), between \$75 000 and \$100 000 (OR = 2.8, 95% CI 1.5–5.5), between \$100 000 and \$150 000 (OR = 2.7, 95% CI 1.4–5.2) and more than \$150 000 (OR = 5.1, 95% CI 2.5–10.5) were more likely to belong to the selective agreement group.

When added to the model including household income only, education and occupation were not associated with selective agreement group membership. The addition of these variables to the model attenuated the association between some household income categories (\$25 000–\$50 000 and \$50 000–\$75 000) and selective agreement group membership. The remaining household income categories were not attenuated by the addition of education and occupation to the model. With ethnicity, age, and sex also in the model, education and occupation remained unassociated with selective agreement group membership.

In the final adjusted weighted model, age ≥ 25 years, being a male, being a Caucasian and having a greater household income were associated with a greater likelihood of being part

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Table 1 Socio-demographic characteristics of participants in the sample ($n = 961$)

	<i>Analysis data set (unweighted)</i>		<i>Analysis data set (weighted)</i>		<i>2011 census</i>
	<i>n</i>	<i>Per cent</i>	<i>n</i>	<i>Per cent</i>	<i>Data^a</i>
Household income					
Less than \$25 000	74	9.9	68	8.7	N/A
Between \$25 000 and \$50 000	160	21.3	138	17.7	N/A
Between \$50 000 and \$75 000	184	24.5	191	24.5	N/A
Between \$75 000 and \$100 000	128	17.0	141	18.1	N/A
Between \$100 000 and \$150 000	137	18.2	163	20.9	N/A
More than \$150 000	68	9.1	78	10.0	N/A
Age					
18–24	44	5.8	113	11.7	8.1 ^b
25–39	110	14.5	224	23.3	22.3
40–54	247	32.5	270	28.0	20.6
55–64	22	2.9	149	15.5	11.1
65–74	190	25.0	82	8.5	6.1
75 and above	148	19.4	125	13.0	6.7
Sex					
Male	298	31.0	459	47.6	48.9
Female	663	69.0	506	52.4	51.1
Ethnicity					
Caucasian	873	90.8	866	89.7	87.2
Other	88	9.2	99	10.3	12.8
Education					
Not completed secondary/high school	86	8.9	69	7.1	13.5
Completed secondary/high school	178	18.5	193	20.0	22.9
Some technical or community college	50	5.2	42	4.3	N/A
Completed technical or community college	166	17.3	153	15.8	82.4
Some University	116	12.1	121	12.5	N/A
Bachelor's degree	279	29.0	303	31.4	18.5
Higher than Bachelor's degree	86	8.9	85	8.8	1.7
Occupation					
Professional/management	211	25.0	249	29.9	N/A
Clerical/sales/service	114	13.5	122	14.6	N/A
Manual/construction/trades	35	4.1	59	7.1	N/A
Homemaker/student/unemployed	94	11.1	152	18.2	N/A
Retired	391	46.3	251	30.1	N/A
Other	116	13.7	132	15.8	N/A

^aData is available from Statistics Canada (<https://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-csd-eng.cfm?Lang=eng&GK=CSD&GC=4711066>) and (<https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/fogs-spg/Pages/FOG.cfm?lang=E&level=4&GeoCode=4711066>).

^bStatistics Canada age groups are 15–19 and 20–24 years.

of the selective agreement group (Table 2). For instance, compared with the youngest group, adults aged 25–39 (OR = 2.8, 95% CI 1.3–6.3), 40–54 (OR = 6.9, 95% CI 3.4–15.1), 55–64 (OR = 6.7, 95% CI 3.1–15.5), 65–74 (OR = 6.7, 95% CI 2.6–17.7) and 75 or older (OR = 6.0, 95% CI 2.3–

16.0) were more likely to belong to the selective agreement group. Females were less likely than males to belong to the selective agreement group (OR = 0.7, 95% CI 0.5–0.9). Also, other ethnicities were less likely than Caucasians to belong to the selective agreement group (OR = 0.4, 95% CI 0.2–0.7).

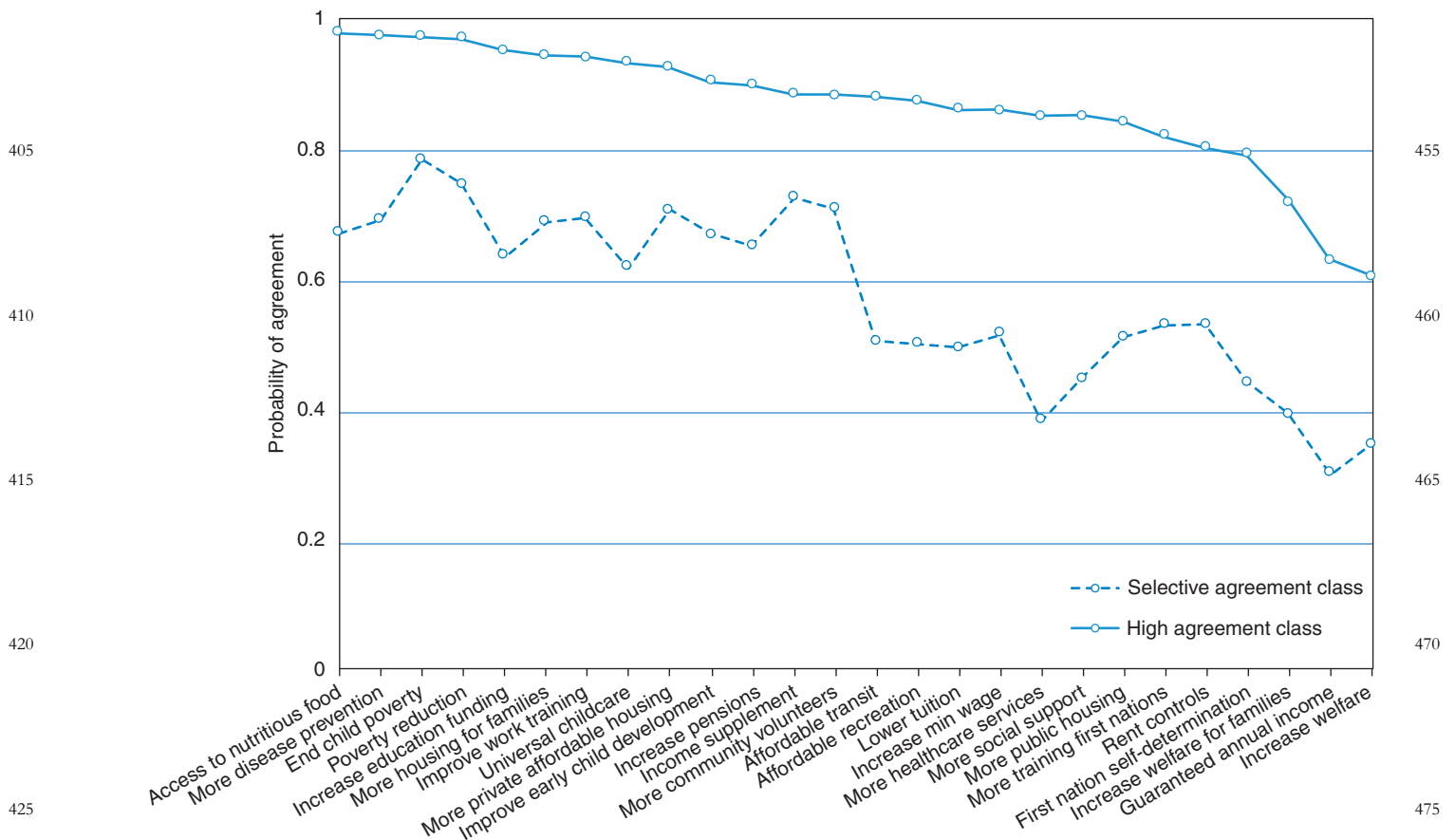


Fig. 1 Results of the latent class analysis for supporting different policy approaches to reduce health inequalities.

Individuals with a household income between \$75 000 and \$100 000 (OR = 2.4, 95% CI 1.1–5.4), and more than \$150 000 (OR = 4.2, 95% CI 1.8–10.3) were more likely to belong to the selective agreement group than those whose household income was below \$25 000. Figure 2 shows the adjusted predicted probabilities of being in the selective agreement group.

Discussion

Main finding of this study

This paper examined people's willingness to support policy options to reduce social inequalities in health. Our study is novel in that it combined various policies to reduce social inequalities in health into population agreement categories. Our study found that people in Saskatoon supported policy approaches to reduce health inequality. Understanding public agreement with policies to reduce social inequalities in health is an important first step in acting to reduce these inequalities.^{16,22} Our results showed that two distinct groups exist in Saskatoon with respect to policy support. The high agreement group tends to agree with all policies; the selective agreement

group agrees with many of the 26 policies to reduce social inequalities included in the questionnaire. However, the selective agreement group is relatively less in favour of a guaranteed annual income, welfare for adults and parents with kids, low tuition for secondary education, health care spending, social support and more self-determination for First Nations and Métis. The results also show that respondents in the selective agreement group are more likely to be from higher income groups compared with the high agreement group.

Our results provide evidence to understand not only the support shown by Saskatoon citizens for policy options to reduce health inequalities but also explore factors that correlate with group membership. Participants in our study supported policies to reduce poverty, increase funding for education, creation of health promotion and disease prevention programmes, and policies that ensure access to more affordable and nutritious food. This group of policies has demonstrated a positive contribution to reducing health inequalities in Canada.²³ On the other hand, our results indicate that being a Caucasian, having a household income higher than \$75 000, being over 25 years of age and being a male

Table 2 Unadjusted and adjusted odds ratios (OR) estimates and 95% confidence intervals (95% CI) of the logistic regression that assessed the probability to belong to the selective agreement class.

	<i>Unadjusted unweighted analysis</i>		<i>Adjusted weighted analysis</i>	
	<i>OR</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>
Household income				
Less than \$25 000 (Ref)	1.00	—	1.0	—
Between \$25 000 and \$50 000	2.0	1.0–3.8	1.4	0.7–3.1
Between \$50 000 and \$75 000	1.9	1.0–3.6	1.6	0.8–3.7
Between \$75 000 and \$100 000	2.8	1.5–5.5	2.4	1.1–5.4
Between \$100 000 and \$150 000	2.7	1.4–5.2	2.0	0.9–4.6
More than \$150 000	5.1	2.5–10.5	4.2	1.8–10.3
Age				
18–24 (Ref)	1.0	—	1.0	—
25–39	2.9	0.8–10.6	2.8	1.3–6.3
40–54	6.8	2.0–23.0	6.9	3.4–15.1
55–64	5.6	1.6–19.0	6.7	3.1–15.5
65–74	5.6	1.6–19.3	6.7	2.6–17.7
75 and above	4.2	1.2–14.9	6.0	2.3–16.0
Sex				
Male (Ref)	1.0	—	1.0	—
Female	0.7	0.5–0.9	0.7	0.5–0.9
Ethnicity				
Caucasian (Ref)	1.0	—	1.0	—
Other	0.4	0.2–0.7	0.4	0.2–0.7
Education				
Higher than Bachelor's degree (Ref)	1.0	—	1.0	—
Not completed secondary/high school	0.6	0.3–1.2	1.4	0.6–3.0
Completed secondary/high school	0.8	0.4–1.3	1.1	0.6–1.9
Some technical or community college	0.8	0.4–1.9	1.3	0.5–2.9
Completed technical or community college	1.2	0.7–2.1	1.7	0.9–3.0
Some University	0.9	0.5–1.7	1.7	0.9–3.3
Bachelor's degree	0.9	0.6–1.5	1.5	0.8–2.5
Occupation				
Professional/management (Ref)	1.0	—	1.0	—
Clerical/sales/service	0.7	0.4–1.2	0.9	0.5–1.5
Manual/construction/trades	0.6	0.3–1.4	0.7	0.3–1.3
Homemaker/student/unemployed	0.4	0.2–0.7	0.8	0.5–1.4
Retired	0.7	0.5–1.0	0.9	0.5–1.7
Other	0.6	0.4–1.0	1.1	0.6–1.7

were highly associated with belonging to the selective agreement group and not supporting policies that have been demonstrated to reduce social inequalities in health (i.e. increase healthcare services, increase welfare, provide a guaranteed annual income or increase welfare payments).

What is already known on this topic?

Past research about public policy support shows similar and contrasting results.^{5,12,13} Compared with a similar survey

conducted among Saskatoon residents in 2005,¹² we found that our results in 2013 showed a similar level of support for policy approaches, such as welfare supplements, creation of subsidized training for adults and creation of more disease prevention and housing programmes. Moderate support for housing policies in our results is interesting given that housing affordability is a major determinant of health, internationally,²⁴ in Canada¹⁶ and Saskatoon.^{25,26} In contrast, more support was shown in the current study for options that included

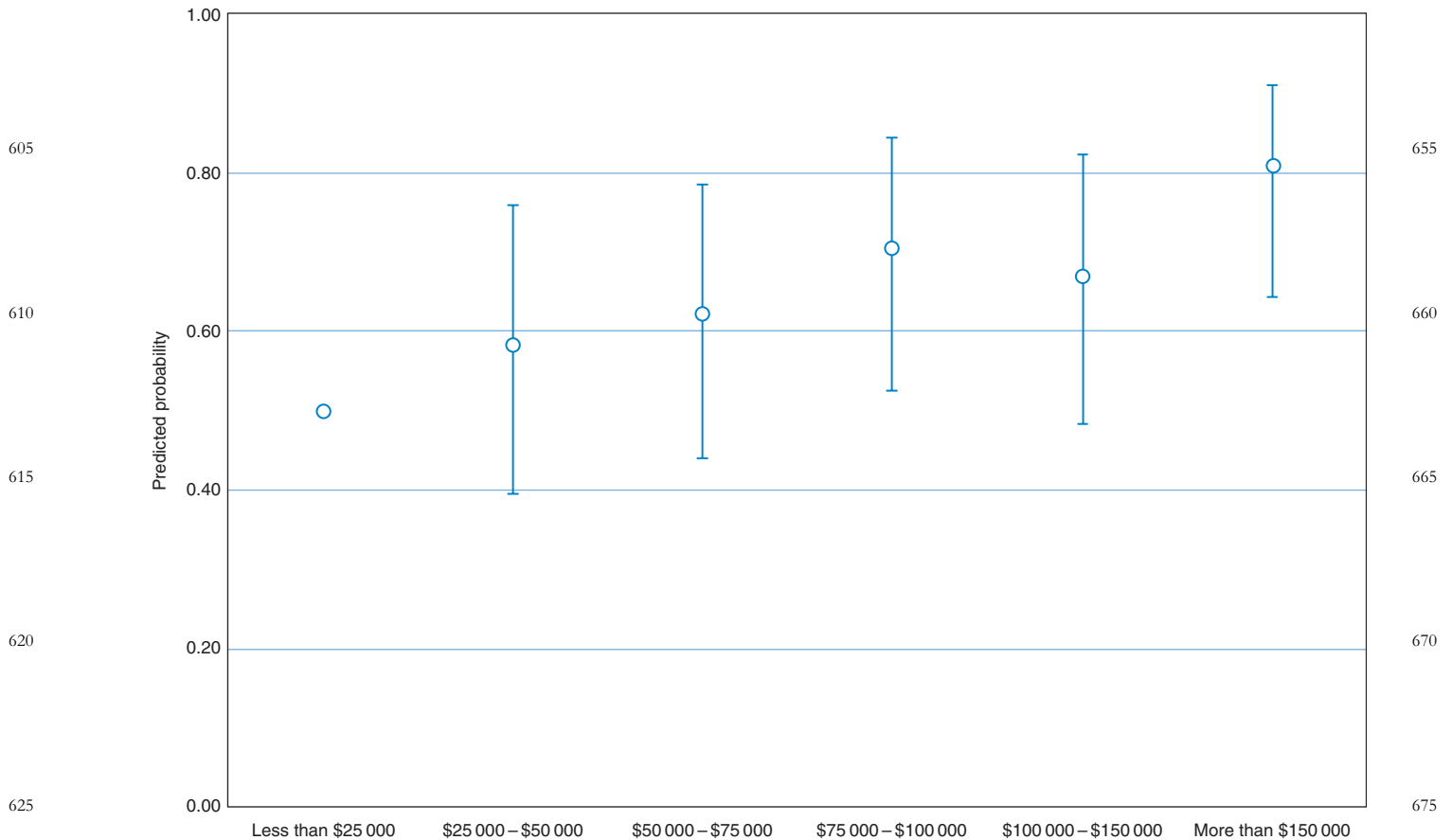


Fig. 2 Adjusted predicted probabilities of being in the selective agreement group by household income category.

increments in pension plans for seniors, creation of child care, access to more nutritious food and more self-determination for First Nations and Métis groups. Also, the 2005 survey found that women, Caucasians and those with any other ethnic background (excluding Aboriginal), people with a household income $>$ \$25 000 and those aged 40 years and more were more likely to support transferring healthcare money to create education and affordable housing programmes. These findings partially coincide with our results. We found that women and participants with an ethnic background different than Caucasian were more supportive of policies to reduce social inequalities in health.

A study conducted by Danis *et al.*¹⁷ of 431 low-income residence of Washington, DC examining support for interventions (i.e. education, employment, health and dental care, housing, transportation, nutrition, neighbourhood improvement, healthy behaviours and income supplements) to address socioeconomic determinants of health showed that non-white (Latinos and Black) individuals were more supportive of providing adult education. Latinos were also willing to support childhood education and day care, while Black individuals supported nutrition policies and creation of more grocery

store locations. These results are similar to our findings in which individuals classified into the high agreement group were more supportive of creating more affordable child care, providing subsidized work training for adults and ensuring access to affordable and nutritious food.

What this study adds?

Our results align with findings from qualitative studies exploring what lay people think about health inequalities. Overall, these qualitative studies suggest that individuals emphasize behaviour change interventions and access to health services at important to reduce health inequalities.^{27,28} In a study conducted in Canada between 1999 and 2001²⁸ that included lower income people to assess factors influencing use of health services, the researchers asked the participants to make recommendations to change health policies. Interviewed individuals highlighted that improvement in accessing health services, service providers being more sensitive toward poverty and increased advocacy for those living in poverty were important strategies to improve health services and programmes.

Ramji *et al.*⁵ compared public preferences for government spending on public health services not covered by Medicare.

They found that women were significantly less supportive of ranking governmental spending on child care as a priority compared with men, even considering that child care is viewed as an important issue by Canadians.²⁹ This result is contrary to our findings; however, Ramji *et al.* also found that younger people were less supportive of ranking pharmacare as a priority for government spending, which could be aligned with our results showing that younger individuals highly supported policies to create more prevention and health promotion programmes compared with older groups.

Understanding opinions and preferences for policies to reduce health inequalities is important in policy development and implementation across the political spectrum. For example, the current study shows high agreement from both classes to creating income supplements to move people off welfare and developing a plan to end child poverty. This suggests that regardless of the political ideology of the government in power the policies would be supported by the population.

Future research on topic of support for policies to reduce health inequalities could replicate our findings in different political contexts to study variation in support for policies to reduce health inequalities. Intervention studies testing the effectiveness of messaging about how to reduce health inequalities are also feasible and important.

Limitations of this study

Our sample included only people with a landline telephone, which could affect the representativeness of the sample. Our sample shows an over-representation of individuals aged 40 years or more and females which is likely a direct result of the sampling methodology. Chappell and Funk showed that women are more likely to participate in surveys than men.³⁰ To overcome over-representation of women and adults aged 40 or more, the logistic regression analyses were performed with weighted post-stratification weights by age and sex. Additionally, a high percentage of participants did not respond to the household income question, which could bias the results. The categories for the income question were not mutually exclusive, which could result in misclassification of income. Due to small sample sizes in certain population subgroups, we were not able to conduct potentially meaningful subgroup analysis. For example, we were unable to compare different non-Caucasian ethnic groups.

Conclusion

In conclusion, our study provides a new approach to classify agreement for a number of policy options to reduce social inequalities in health. Our results show that Saskatoon residents support policies to reduce poverty, increase funding for

education, creation of health promotion and disease prevention programmes, and policies that ensure access to more affordable and nutritious food. Our findings show that being a Caucasian, having a household income greater than \$75 000, being over 25 years of age and being a male were associated with having lower support (i.e. belonging to the selective agreement class) for policies to increase healthcare services, increase welfare, provide a guaranteed annual income or increase welfare payments.

Supplementary data

Supplementary data are available at the *PUBMED* online.

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