Supplementary Information For: Limited impacts of carbon tax rebate programs on public support for carbon pricing

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Supplementary Information

1 Summary of carbon pricing policies in Canada

Canada is a federal country in which four of ten provincial governments had adopted their own carbon pricing policies prior to announcement of a federal carbon pricing framework.

Quebec was the first province to introduce a carbon price, with a modest carbon tax in October 2007. This tax was replaced by an emissions trading scheme in 2013, that now covers industry, transportation and household emissions. Quebec's system is linked with California's carbon market. Auction revenues are earmarked for environmental expenditures. In 2008, British Columbia implemented a $10/tonne carbon tax covering both households and industry sources. The tax gradually increased to $30/tonne through 2012, at which point it was frozen. Tax revenues were returned through a combination of broad tax cuts and more targeted credits. In 2017, British Columbia adopted a new schedule of tax increases that will reach $50/tonne in 2021, with revenues above $30/tonne earmarked for green spending and industry rebates. Ontario joined the joint California-Quebec trading regime in 2018, but withdrew in 2018 following a provincial change in government. Finally, Alberta established a baseline and credit system for industry emissions in 2007. The province then added a carbon tax on households in 2017. Revenues from the household tax were allocated using a combination of subsidy programs, dividends for low- to middle-income households, and general revenues. Alberta later repealed this system after a provincial change in government in mid-2019.

In 2016, the federal government announced that a federal carbon price would be implemented in any province that did not adopt either a carbon tax escalating to $50/tonne by 2022 or an emissions trading scheme that achieved comparable reductions. In 2018, the federal government confirmed that the federal price for households and other small sources would take the form of a carbon tax and dividend. (A separate output based pricing scheme was devised for industrial sources, but our analysis is exclusively focused on the household tax and rebate scheme.) The carbon tax dividend, called the Climate Action Incentive Payment, is distributed as an income tax credit. The amount is based on the number of adults and children in a household. Rural households receive a 10 percent increase in their rebate amount. All carbon tax revenues are returned to the province of origin, with 90% sent to households and 10% to municipalities, schools, and hospitals. Because there is significant variation in provincial emissions per capita, there is also variation in carbon taxes paid and, thus, the size of household rebates. In December 2020, the government announced a revised schedule that would increase the carbon tax rate to a rate of $170 per tonne by 2030, and a shift to direct rebates by cheque rather than income tax credits.

The result is considerable variation in carbon pricing systems across Canadian provinces.[1]. In 2019, the federal tax scheme was applied in four provinces (Saskatchewan, Manitoba, Ontario, and New Brunswick), four provinces had their own carbon taxes (British Columbia, Alberta, Newfoundland and Labrador, and Prince Edward Island), and two (Quebec and Nova Scotia) had separate emissions trading schemes. Alberta repealed its carbon tax in 2019 and became subject to the scheme in 2020. In contrast, New Brunswick replaced the federal tax with a provincial carbon tax in 2020. The federal tax currently covers three fifths of the Canadian population.

2 Carbon pricing policies in Switzerland

The Swiss climate rebate is linked to the country's national carbon tax. Roughly one-third of tax revenues are invested in programs to reduce building-related carbon pollution and a clean technology fund. The remaining two thirds are redistributed to the economy and the public. The public rebates are on a per capita basis and redistributed through the health insurance bill. This procedure was chosen for practical reasons. As health insurance is mandatory for all residents in Switzerland, the health insurance companies have the most up-to-date address list. Moreover,

[1]Dobson, S., Winter, J. & Boyd, B. 2019. "The Greenhouse Gas Emissions Coverage of Carbon Pricing Instruments for Canadian Provinces." The School of Public Policy Publications 12

using the health insurance bill as a vehicle for the rebate incurs low implementation costs; the same system had already been in place for an incentive tax on volatile organic compounds (VOC).

The Swiss CO2 levy grew out of a 1999 climate reform that tied Swiss pollution reduction targets to the country's Kyoto Protocol commitments. The initial reform comprised voluntary measures but established a carbon tax that could come into effect and ratchet up if the country did not meet defined intermediate greenhouse gas emissions targets. When Switzerland failed to meet these intermediate targets, a carbon tax came into effect that increased from 12 CHF per tonne in 2008 to CHF 96 per tonne in 2018. The policy now stands as one of the highest carbon tax rates in the world.[2] However, it only taxes fossil fuels used to generate heat, light or electricity, while transportation is excluded.

The introduction and design of the Swiss CO2 levy was the result of a political compromise during policy negotiations. In the country's 2000 climate reforms, the CO2 levy was introduced as a "subsidiary" measure, that would only be implemented if voluntary measures were ineffective. This solution was acceptable to both industry, who hoped its introduction would be unnecessary, and environmentalists who wanted to prioritize getting some form of carbon price passed.[3]. The dividend emerged because business actors, sceptical of a carbon tax generally, were even more sceptical that the government should use revenues to intervene in the economy through earmarking. In 2006, when the introduction of the CO2 levy was triggered and the parliament debated policy design, the interests of the business community remained dominant. During policy debate, the government emphasized the long-term negative price incentives of the tax for businesses and households; by contrast, the potential benefits associated with the dividend for households with small carbon footprints was not an important issue (rather a potential regressive effect was discussed).[4] Contemporaneous media coverage of the policy mentioned the rebate as a side-note, with no further explanation for what this redistribution implied; conversely, the increased heating prices for households made it into the headlines.[5]

Beside these government initiated reforms, several popular initiatives and related counter proposals targeted carbon taxation. In 2000, three proposals were at the ballot, which aimed at taxing fossil energy and promoting renewable energy.[6]. While rejected, two of them received a popular support of more than 40 % - which is quite impressive given that this was 20 years ago. More recently, in 2015 Swiss citizens voted on an initiative, launched by the Green Liberal

[2]Ramstein, C.et al. 2019. *State and trends of carbon pricing 2019. The World Bank*

[3]Ingold, K. 2008. *Les mécanismes de décision: Le cas de la politique climatique Suisse.* Rüegger Verlag

[4]305.057, Botschaft zur Genehmigung des CO2-Abgabesatzes für Brennstoffe vom 22.Juni 2005.

[5]e.g., "Haushalte spuren die CO2-Abgabe", Der Landbote, 30 January, 2007.

[6]Ingold, K. 2008. *Les mécanismes de décision: Le cas de la politique climatique Suisse.* Rüegger Verlag; Bornstein, N. & Lanz, B. 2008. "Voting on the environment: Price or ideology? Evidence from Swiss referendums". *Ecological Economics* 67,430–440

party, to replace the existing value-added tax with a tax on non-renewable energy. However, this very extreme proposal also included some severe design and implementation problems and only received 8% of votes.[7]

At the governmental side, the parliament – after a long and difficult process – accepted a revised CO2 law in 2020, which not only aimed at increasing the existing CO2 levy to up to 210 CHF per tonne, but also at expanding carbon pricing to the transportation sector. While supported by all major parties (except the right-wing People's Party) as well as by more than one hundred organizations from civil society, including major economic associations, the law was rejected in a referendum vote on June 13, 2021, by 51.6 % of the voters.

In sum, even though the CO2 levy has been in place for more than a decade and has an even longer political history, political debate and communication has heavily concentrated on the cost dimension while the potential benefits of the dividend have never played an important role in the political or public debate. While different factors may have led to the recent rejection of the revised CO2 law at the ballot (yet to be identified), it can be argued that the low visibility of knowledge about the existing scheme was a barrier (or at least a missed opportunity) to using previous experience.[8]

Against this background, the case of Switzerland offers unique opportunities to study the link between visibility, knowledge and popular support for carbon price and rebate policies.

[7]See also Carattini, S., Baranzini, A., Thalmann, P., Varone, F. & Vohringer, F. 2017. "Green taxes in a post-Paris world: Are millions of nays inevitable?". *Environmental and Resource Economics*. 68: 97-128.

[8]See e.g. Carattini, S., Baranzini, A. & Lalive, R. 2018. "Is taxing waste a waste of time? Evidence from a Supreme Court decision." *Ecological Economics* 148: 131–151 for increasing policy support.

3 Canada: Carbon pricing support across first four panel waves

In the main text, we present results among respondents who remained in our survey across all five survey waves (n=899). Here, we show trends among respondents who remained in the survey across the first four waves (n=1190 - all pre-COVID-19). Trends across these waves closely track the trends in the first four waves of Figure 1, as presented in the main text.

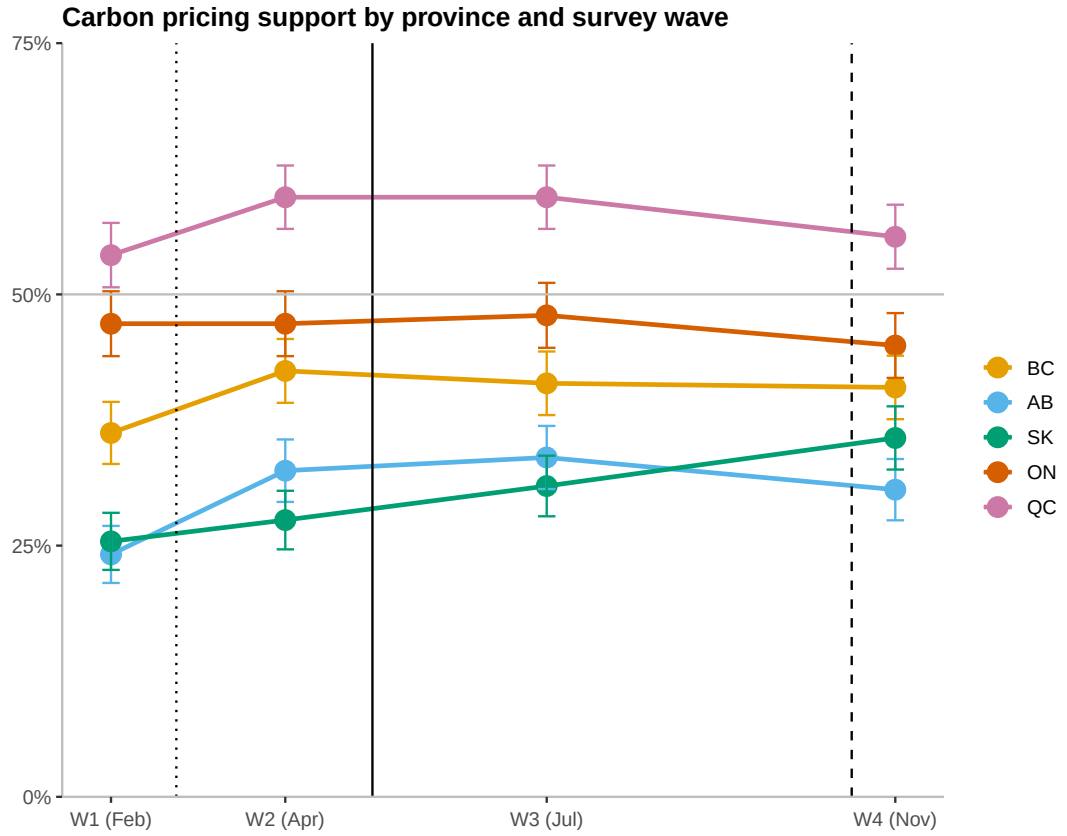


Figure A1: Support for carbon pricing by province across waves. Wave 1 was conducted in February 2019 and wave 4 in November 2019. The dotted line indicates when the federal carbon tax policy came into effect. The solid line indicates the approximate period during which households received their climate rebates. The dashed line indicates the timing of a federal election in which climate policy, including the carbon tax, was highly salient. Respondents in Saskatchewan (green) and Ontario (red) received a federal climate rebate associated with Canada's 2019 carbon tax. Other respondents were subject to provincial carbon pricing policies that had few, if any rebate, components.

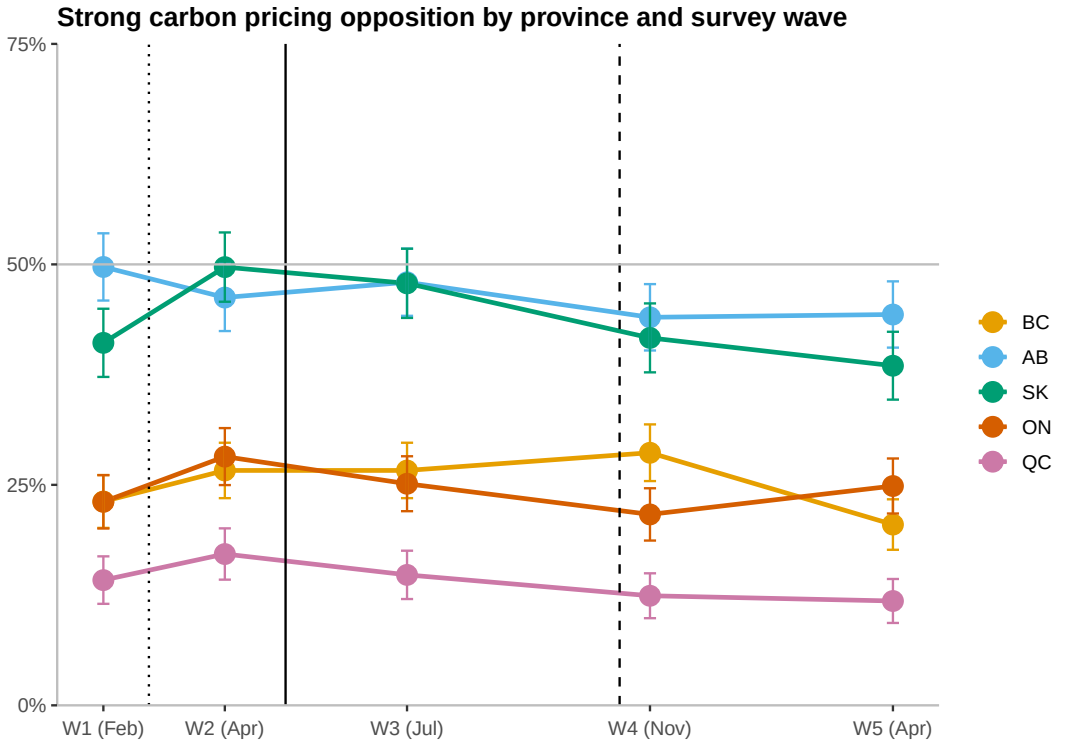


Figure A2: Strong opposition to carbon pricing by province across waves. Wave 1 was conducted in February 2019 and wave 5 in April 2020. The dotted line indicates when the federal carbon tax policy came into effect. The solid line indicates the approximate period during which households received their climate rebates. The dashed line indicates the timing of a federal election in which climate policy, including the carbon tax, was highly salient. Respondents in Saskatchewan (green) and Ontario (red) received a federal climate rebate associated with Canada's 2019 carbon tax. Other respondents were subject to provincial carbon pricing policies that had few, if any rebate, components.

4 Canada: Carbon pricing opposition over time

In the main text, we presented trends in carbon pricing support over time; here we present the inverse analysis. Extended Data Figure 1 visualizes trends in opposition to carbon pricing opposition. Figure A2 measures *strong* opposition to carbon pricing. Opposition is measured as a respondent who indicated they either "strongly" or "somewhat" opposed carbon pricing. Strong opposition is restricted to respondents who indicated "strongly".

5 Canada: Differential trends in carbon pricing support across rebate and non-rebate provinces

In the main text (Figure 1), we visualized trends in support for carbon pricing across time in both rebate and non-rebate provinces to evaluate the descriptive presence of a differential support trend between federal-tax provinces (with a full rebate) and provincial-tax provinces (without). Here, we conduct an exploratory analysis to assess the presence of differential support trends after the federal carbon tax coming into effect on April 1st, and then after the first year's climate dividends were returned to Canadians through income tax rebates by June 2019. This analysis should not be interpreted as causal.

Causal identification would require a series of assumptions, the most critical of which is the presence of "parallel trends" in our treatment and control groups. Stated simply, we would require that carbon pricing support in Ontario and Saskatchewan would trend parallel to British Columbia and Quebec in the absence of the federal policy intervention. However, because we only have 1 pre-treatment observation (Wave 1), we cannot interrogate this assumption using our panel data.

Instead, one indirect test of parallel trends exploits a separate over-time dataset of Canadian climate opinions collected since 2011 by the Canadian Surveys on Energy and the Environment (CSEE) at the University of Montreal.[9] In Figure A3, we explore Canadian support for carbon pricing through a cap and trade system over time by province. We omit Saskatchewan because there are insufficient respondents from this province in the dataset. We do find some evidence of parallel trends since 2011 in Canadian support for emissions trading across all provinces.

However, we find that the parallel trends assumption is violated by the Fall of 2018 (several months before our panel began) for preferences over carbon taxation specifically, as shown in Figure A4. This is not surprising, since the 2018 CSEE data were collected *after* the federal government announced in October 2018 that it would apply its own carbon tax in select provinces, generating a polarized debate within federal carbon tax provinces (then Ontario, Saskatchewan, Manitoba and New Brunswick). In addition, the province of Alberta adopted a controversial carbon tax of its own in 2017. In the main text, we use the special case of Alberta to assess whether this type of announcement effect might be driving observed patterns of carbon pricing support.

[9] Lachapelle, E., Borick, C. P. & Rabe, B. 2012. "Public attitudes toward climate science and cli-mate policy in federal systems: Canada and the United States compared". *Review of Policy Research 29: 334.*

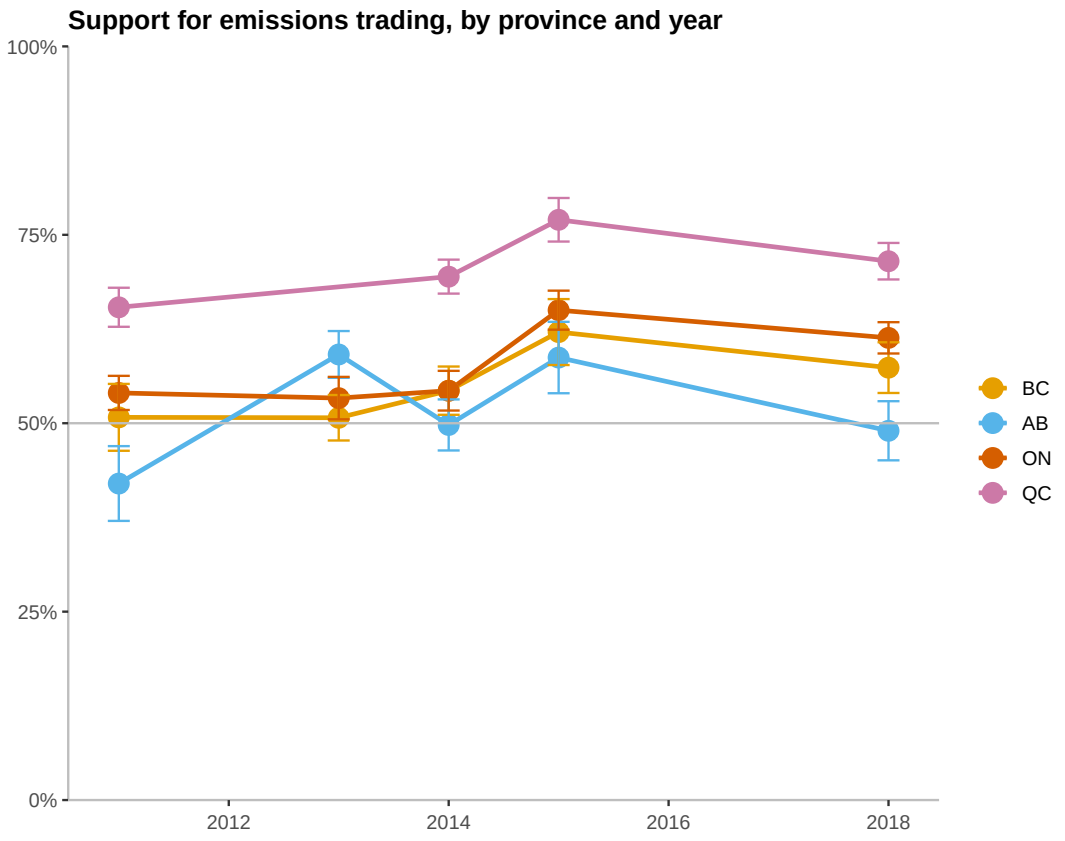


Figure A3: **Support over time for a carbon price using emissions trading**, by province. Data from the Canadian Surveys on Energy and Environmnent, University of Montreal.

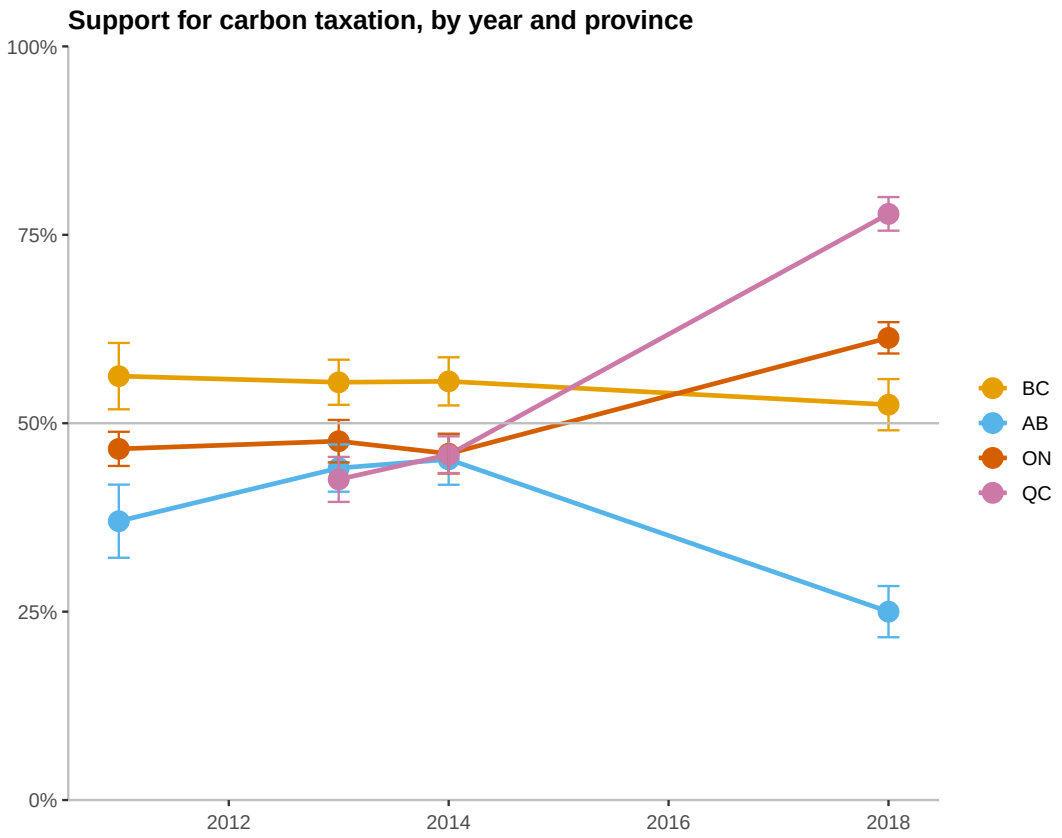


Figure A4: **Support over time for a carbon price using a carbon tax**, by province. Data from the Canadian Surveys on Energy and Environmnent, University of Montreal.

This likely violation of parallel trends is compounded by the presence of information spillovers: respondents in non-rebate provinces still heard about the federal policy and, as described in the main text, often incorrectly believed that the federal climate tax and rebate policy applied to them. This creates the possibility of non-rebate provinces being "treated" in some way, which would generate downward biases in any estimates. At the same time, some people in rebate provinces did not realize they were subject to the policy, potentially generating bias in the opposite direction.

With these caveats, we offer an exploratory analysis of differential trends between rebate and non-rebate provinces. In general, our ability to track the same individuals through time allows for major efficiency gains versus differential trends analyzed from repeated cross-sectional data. This is because our analysis is not subject to over-time variability in who is sampled into each wave's cross-sectional snapshot.

These exploratory results are presented as Table A1 and, again, should not be construed as causal. We undertake our analyses using three versions of our datasets (columns). In the first column, we analyze the returning set of panelists who completed surveys across all five waves. In column 2, we analyze the set of panelists who remained in our panel through the last wave tested in that specific differential trends analysis. In column 3, we further boost sample size by adding the cross-sectional data that we simultaneously collected each wave to test for design effects (see Methods). In this way, Columns 1 and 2 are specifications with balanced panels, while Column 3 uses an unbalanced panel. We do not see differences in results between balanced and unbalanced specifications.

We test three differential trends using these datasets. First, we evaluate the effect of application of the tax in April 2019 on support for the policy (DID: wave 2 vs. wave 1). We find a negatively-signed relationship between being in a rebate province and carbon pricing support between wave 1 and wave 2. This effect approaches statistical significance in models 3, though not at conventional levels. Comparing waves 2 and 3, we find an insignificant but positively signed coefficient of being in a rebate province on support, again approaching significance but not at conventional level and only in model 3. We also consider the medium-term impact of the tax, analyzing differences in support between our first and last wave, but find insignificant results with varying signs.

In these analyses, we bundle Ontario and Saskatchewan, but visual inspection of Figure 1 suggests that trends in Saskatchewan may deviate from the other four provinces in our sample (see Figure 1), at least through the first four waves before support in the province declines

Table A1: **Testing differential trends in the effect of the carbon tax's introduction (top) and the receipt of rebates (middle, bottom) on Canadian public support for Carbon pricing**. Residents of Ontario and Saskatchewan are classified as treated; residents of BC and Quebec are classified as untreated.

DID: Wave 2 vs. Wave 1	(1) *Panelists Through Wave 5*	(2) *Panelists Through Wave 2*	(3) *All Respondents*
Wave 2	0.057	0.048*	0.040†
	(0.037)	(0.024)	(0.022)
Fed Price Province	−0.050	−0.130***	−0.123***
	(0.036)	(0.023)	(0.019)
Wave 2:Fed Price Province	−0.054	−0.043	−0.052†
	(0.052)	(0.033)	(0.030)
Constant	0.421***	0.485***	0.492***
	(0.026)	(0.017)	(0.014)
DID: Wave 3 vs. Wave 2	*Panelists Through Wave 5*	*Panelists Through Wave 3*	*All Respondents*
Wave 3	0.024	0.012	−0.020
	(0.037)	(0.032)	(0.026)
Fed Price Province	−0.104**	−0.154***	−0.174***
	(0.037)	(0.030)	(0.023)
Wave 3:Fed Price Province	0.003	0.066	0.062†
	(0.052)	(0.049)	(0.037)
Constant	0.478***	0.477***	0.532***
	(0.026)	(0.020)	(0.017)
DID: Wave 5 vs. Wave 1	*Panelists Through Wave 5*		*All Respondents*
Wave 5	0.067†		−0.005
	(0.037)		(0.029)
Fed Price Province	−0.050		−0.122***
	(0.036)		(0.000)
Wave 4:Fed Price Province	−0.031		0.042
	(0.052)		(0.042)
Constant	0.042***		0.49***
	(0.026)		(0.014)
Note:		†p<0.1,*p<0.05; **p<0.01; ***p<0.001	

through wave 5. This effect may be a function of the larger rebate sizes in Saskatchewan or the political dynamics surrounding Ontario's repeal of emissions trading shortly before the implementation of the federal tax and rebate program. To explore this, we drop Ontario responses to analyze Saskatchewan's pattern discretely. Being a resident of Saskatchewan is associated with a non-significant decrease in support between waves 1 and 2, a non-significant increase in support between waves 2 and 3 and no significant changes between waves 1 and 5.

Table A2: **Testing differential trends in the effect of the carbon tax's introduction (top) and the receipt of rebates (middle, bottom) on Canadian public support for Carbon pricing** in SK only. Residents of Saskatchewan are classified as treated, contrasted with residents of BC and Quebec who are classified as untreated.

DID: Wave 2 vs. Wave 1	(1) *Panelists Through Wave 5*	(2) *Panelists Through Wave 2*	(3) *All Respondents*
Wave 2	0.057	0.048*	0.040†
	(0.037)	(0.024)	(0.022)
Fed Price Province	−0.151***	−0.216***	−0.208***
	(0.043)	(0.027)	(0.022)
Wave 2:Fed Price Province	−0.051	−0.043	−0.051
	(0.061)	(0.038)	(0.035)
Constant	0.421***	0.484***	0.492***
	(0.026)	(0.017)	(0.014)
DID: Wave 3 vs. Wave 2	*Panelists Through Wave 5*	*Panelists Through Wave 3*	*All Respondents*
Wave 3	0.024	0.009	−0.020
	(0.037)	(0.034)	(0.026)
Fed Price Province	−0.202***	−0.147***	−0.259***
	(0.044)	(0.033)	(0.027)
Wave 3:Fed Price Province	0.025	0.058	0.076†
	(0.062)	(0.053)	(0.043)
Constant	0.478***	0.474***	0.533***
	(0.026)	(0.021)	(0.017)
DID: Wave 5 vs. Wave 1	*Panelists Through Wave 5*		*All respondents*
Wave 5	0.067†		−0.005
	(0.037)		(0.030)
Fed Price Province	−0.151**		−0.208***
	(0.043)		(0.022)
Wave 4:Fed Price Province	−0.014		0.043
	(0.060)		(0.050)
Constant	0.421***		0.492***
	(0.063)		(0.014)
Note:		†p<0.1,*p<0.05; **p<0.01; ***p<0.001	

6 Canada: Carbon pricing support through time, by party preference

Provincial averages mask strong partisan differences in policy perceptions within rebate provinces, as further shown in Table A3. In Ontario, support within each party is stable, though overall support is concentrated among supporters of the Liberal Party of Canada (the party of the government that introduced the carbon tax and rebate policy). In Saskatchewan, partisans of all political stripes somewhat increased their support for the policy through wave 4, though starting from lower baseline levels, and with a decline among Conservative voters between wave 4 and wave 5. While the increase in Saskatchewan was greatest among Liberal supporters, these supporters are outnumbered by Conservative Party of Canada supporters in our Saskatchewan sample by a ratio of about 3:1.

Ontario	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Liberal Party	76.3	76.1	78.8	72.0	75.0
Conservative Party	22.3	21.9	24.2	23.3	32.2
New Democratic Party	56.1	55.2	51.0	40.9	58.3
Saskatchewan	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Liberal Party	69.2	68.6	86.4	81.3	80.9
Conservative Party	9.8	8.4	12.0	17.2	12.8
New Democratic Party	38.8	35.8	40.8	58.8	68.1

Table A3: Percentage support for federal carbon price in Ontario and Saskatchewan over time, by stated party preference in wave 1

In the main text, Figure 2 excluded data from Alberta because the province switched from a provincial carbon tax with targeted rebates in waves 1 and 2, to no carbon tax and no dividend in waves 3 and 4, to the federal tax and dividend scheme in wave 5. Extended Data Figure 2 replicates this figure but includes data from Alberta.

7 Canada: Partisan differences in carbon pricing support by driving habits

While we find strong partisan differences in party support for carbon pricing, this could either be the result of ideological polarization or differences in material exposure to carbon tax costs that are correlated with party.

Table A4: **The percent of Canadians who believe they received a federal climate rebate, by province**. Bold numbers represent incorrect beliefs.

Province	Think Received	Don't Think Received	Not Sure
Received Federal Rebate			
SK	75	**8**	17
ON	55	**28**	17
Did Not Receive Federal Rebate			
BC	**11**	51	38
AB	**13**	53	33
QC	**2**	62	36

To explore this possibility, we consider carbon pricing support over time by party and driving habit, using "driving to work alone" as a proxy for material exposure to carbon tax costs (via gasoline spending). In Extended Data Figure 3 we find that party polarization persists even conditioning on this proxy.

8 Canada: Respondent beliefs that they have received a federal rebate

9 Canada: Persistence of rebate misperceptions in wave 4 of the CCOP

We asked respondents to estimate the size of their rebate, irrespective of whether or not they had actually received one. In the main text, we report respondent beliefs about rebate size in wave 3, immediately after respondents would have received the federal Climate Action Incentive via their tax returns, if eligible. We repeated this same question for respondents in British Columbia, Alberta and Quebec after the 2019 federal election in which the carbon tax and rebate policy was a serious object of policy debate. We found persistent misperceptions among respondents in these provinces: on average, respondents estimated (false) federal rebate amounts of $87 (se $12) in Alberta, $83 (se 13$) in BC, and $67 (se $14) in Quebec.

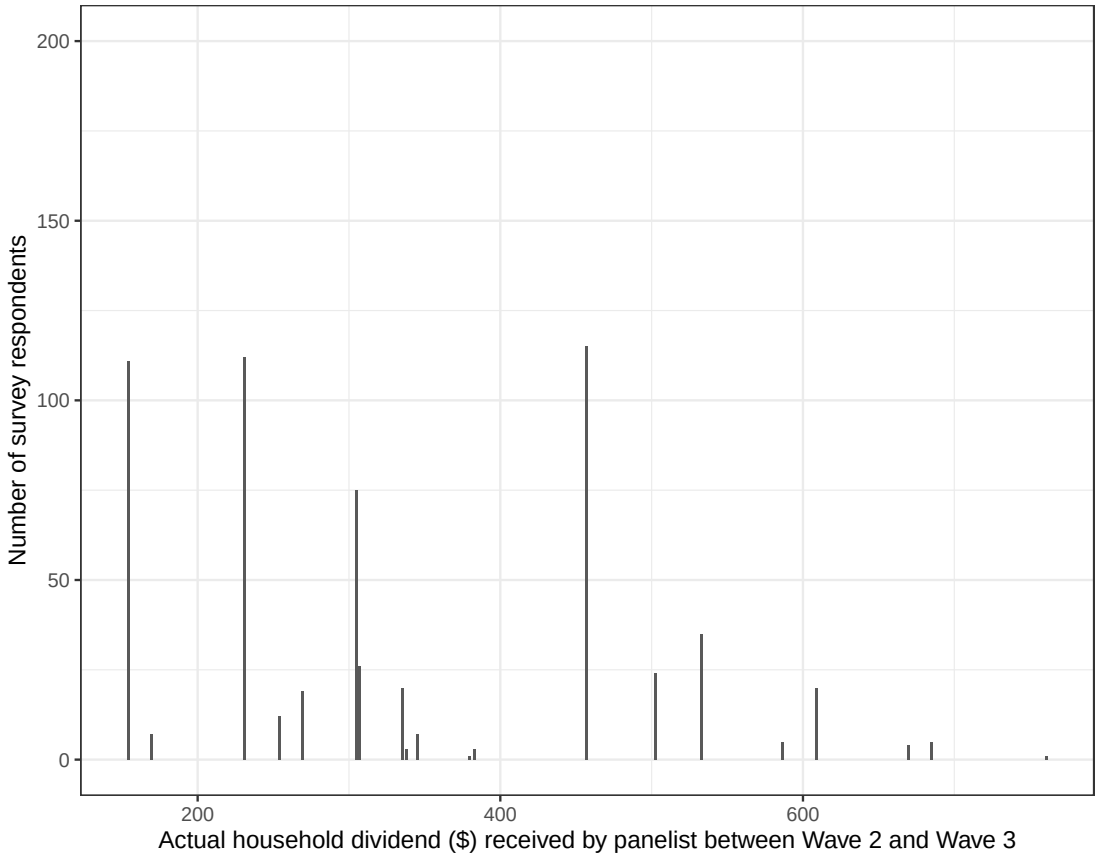


Figure A5: Distribution of actual household rebate sizes for CCOP respondents who remained in the panel as of Wave 3 and resided in the rebate provinces of Ontario and Saskatchewan.

10 Canada: Distribution of rebate perceptions among Ontario and Saskatchewan residents

In our panel, we can calculate the true rebate received for panelists in Ontario and Saskatchewan as a continuous variable; however, we asked respondents to estimate their rebate size using a categorical scale with bins of $100 increments (SI 24 for precise wording).

Across all respondents in rebate provinces, Fig A5 shows the distribution of actual household rebates received between wave 2 and wave 3 of the CCOP (see Methods for how this calculation was performed).

We can also visualize respondent accuracy in placing their rebate in the correct bin, conditional on their actual (received) rebate size. (This approach parallels the analysis of our Swiss data presented as Fig 27 in the main text). Extended Data Figure 4 visualizes this distribution of perceptions by actual rebate amount, again across all respondents. Only one respondent in the panel had a true rebate between $700 and $800, not shown; this respondent estimated their

rebate incorrectly as $0.

These individual-level misperceptions corroborate the averages reported in the main text. Only 24% of Ontario respondents and 19% of Saskatchewan respondents estimated a rebate amount that fell within the correct $100 dollar range of their actual rebate. By contrast, 61% of Ontario respondents and 75% of Saskatchewan respondents underestimated their rebates. Only 14% of Ontario respondents and 6% of Saskatchewan respondents overestimated their rebates.

These misperceptions are associated with party preference. In both provinces, respondents who consistently indicated they would vote for the anti-carbon tax Conservatives across the four waves systematically estimated lower rebate amounts. In Saskatchewan, these consistent Conservative voters estimated a rebate amount of $276 (se $25) while consistent Liberal voters estimated a rebate amount of $341 (se $72). In Ontario, consistent Conservative Party voters estimated a rebate amount of $165 (se $21) while consistent Liberal Party voters estimate a rebate amount of $181 (se $19). However, neither difference is statistically significant (t-test with unequal variances: for SK, t-statistic: -0.85399, p-value=0.40; for ON, t-statistic: -0.58797, p-value=0.56).

11 Canada: Do Canadians understand whether the provincial or federal government is responsible for carbon pricing in their province?

For incumbent governments to benefit electorally from enacting a new benefit, the public must perceive the benefit *and* associate this benefit with the level of government responsible for the benefit. In our panel, can explore this latter condition. Table A5 summarizes the percent of CCOP respondents in each of the first four waves that correctly identified which level of government was responsible for carbon pricing in their province. We find a jump in respondent knowledge about the federal government's carbon price during the early implementation period in both provinces with a federal carbon price (Ontario and Saskatchewan). However, we also find persistent confusion among British Columbia and Quebec residents, where almost half of respondents still wrongly believed the federal government was responsible for carbon pricing in their province by wave 4.

Alberta's policy changed during our panel, creating an even-more confusing messaging environment. We explore the special case of Albertan knowledge of provincial climate reforms separately in this appendix. Specifically, the level of government responsible for provincial car-

Table A5: **Percent of respondents who correctly identified the level of government responsible for their carbon price, by wave**

	% Know Government Level			
	Wave 1	Wave 2	Wave 3	Wave 4
Provincial Price (BC, QC)	41	46	47	48
Federal Price (SK, ON)	43	67	67	62

Note: The policy came into effect between W1 and W2. Households received their rebates between W2 and W3. Between W3 and W4, a federal election occurred in which climate policy, including the carbon tax and rebate, was highly salient.

Table A6: **Albertan Beliefs about Level of Government Responsible for Carbon Pricing.**

	% Wave 1	% Wave 2	% Wave 3
Federal government	18	15	31
Provincial government	64	73	21
Not sure	18	12	6
There is no carbon price	–	–	41

bon pricing in the province changed during our panel as a result of the April 2019 provincial election. The United Conservative Party, which won the election, repealed the province's carbon price on June 1 2019, leading the federal government to announce in mid-June that it would step in and apply the federal tax and dividend scheme effective January 2020. No Alberta residents had yet received a federal dividend by wave 4, though some would have received provincial rebates. In Table A6, not surprisingly we find substantial shifts in Albertans' responses about the state of carbon pricing policy. In waves 1 and 2, a large majority of respondents understood that the province's carbon price was being set by the provincial government. However, the situation was complicated by wave 3 when 31% of Albertans reported that the federal government was responsible for carbon pricing, an increase over previous waves potentially reflecting anticipation of the federal tax or misunderstanding that it was already in place. Note that response categories changed for wave 3 to reflect the temporary absence of any carbon price at all. This correct answer as of wave 3 was identified by less than half of Alberta respondents. In wave 4, we instead asked Albertan respondents whether their province supported or opposed the federal government's carbon pricing plan. A large majority (86%) of respondents correctly indicated the provincial government opposed federal climate reforms.

12 Canada: Experimental Treatment

Respondents assigned to treatment in our wave 4 survey experiment received the following text:

Please read and look at the following information carefully, paying particular attention to the highlighted information. We may ask you about this information and image in the next section.

All taxpayers living in your province are eligible for a "Climate Action Incentive" rebate.

With this rebate, revenue from the carbon tax gets returned to people in your province through their 2018 income tax returns.

Below we provide a best estimate of the amount your household received (or should have received) in your 2018 income tax return. This estimate is based on the government formula for calculating the rebate, as well as the information you provided in this survey.

Please scroll down to see how much you (should have) received. You can also see how we've calculated our best estimate using the federal government's Climate Action Incentive worksheet.

Respondents then saw a series of custom images like the example presented as Extended Data Figure 6.

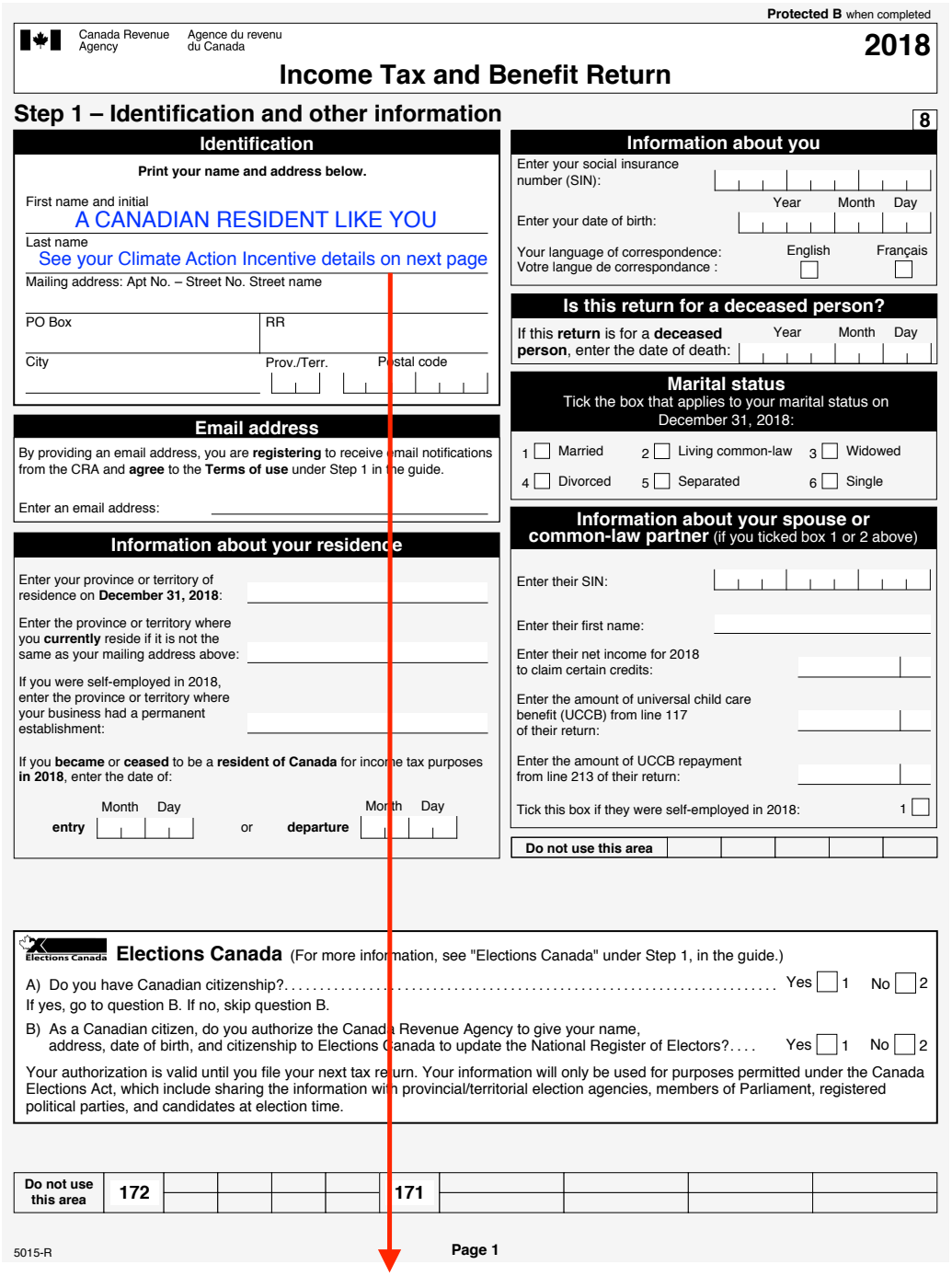
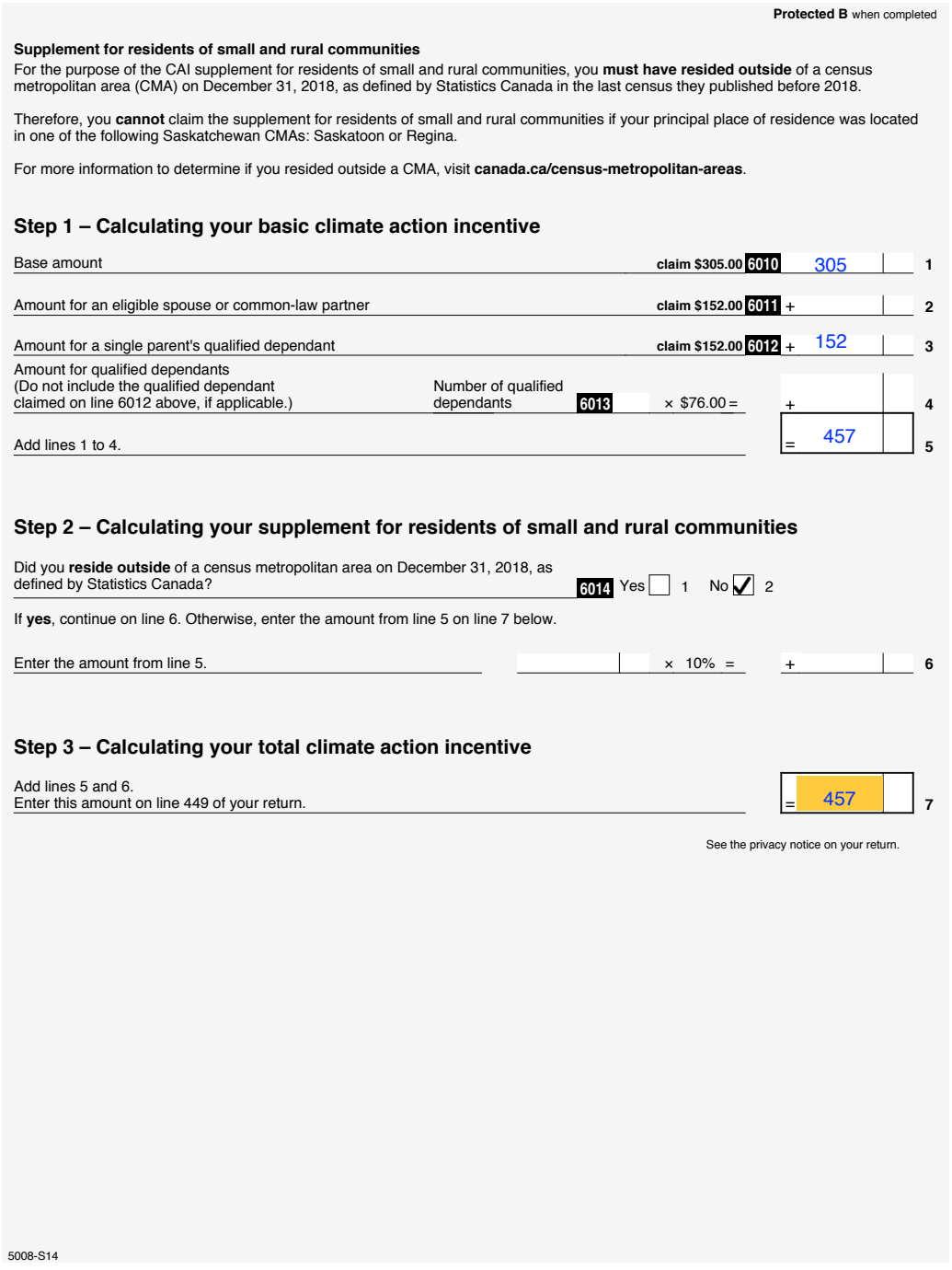


Figure A6: **Example of Messaging Treatment**



Protected B when completed

Supplement for residents of small and rural communities

For the purpose of the CAI supplement for residents of small and rural communities, you **must have resided outside** of a census metropolitan area (CMA) on December 31, 2018, as defined by Statistics Canada in the last census they published before 2018.

Therefore, you **cannot** claim the supplement for residents of small and rural communities if your principal place of residence was located in one of the following Saskatchewan CMAs: Saskatoon or Regina.

For more information to determine if you resided outside a CMA, visit **canada.ca/census-metropolitan-areas**.

Step 1 – Calculating your basic climate action incentive

Base amount	claim $305.00 6010	305		1
Amount for an eligible spouse or common-law partner	claim $152.00 6011	+		2
Amount for a single parent's qualified dependant	claim $152.00 6012	+ 152		3
Amount for qualified dependants (Do not include the qualified dependant claimed on line 6012 above, if applicable.)	Number of qualified dependants 6013 × $76.00 =	+		4
Add lines 1 to 4.		= 457		5

Step 2 – Calculating your supplement for residents of small and rural communities

Did you **reside outside** of a census metropolitan area on December 31, 2018, as defined by Statistics Canada? 6014 Yes ☐ 1 No ☑ 2

If **yes**, continue on line 6. Otherwise, enter the amount from line 5 on line 7 below.

Enter the amount from line 5.		× 10% =	+	6

Step 3 – Calculating your total climate action incentive

Add lines 5 and 6. Enter this amount on line 449 of your return.	= 457		7

See the privacy notice on your return.

5008-S14

Figure A7: **Example of Messaging Treatment (page 2)**

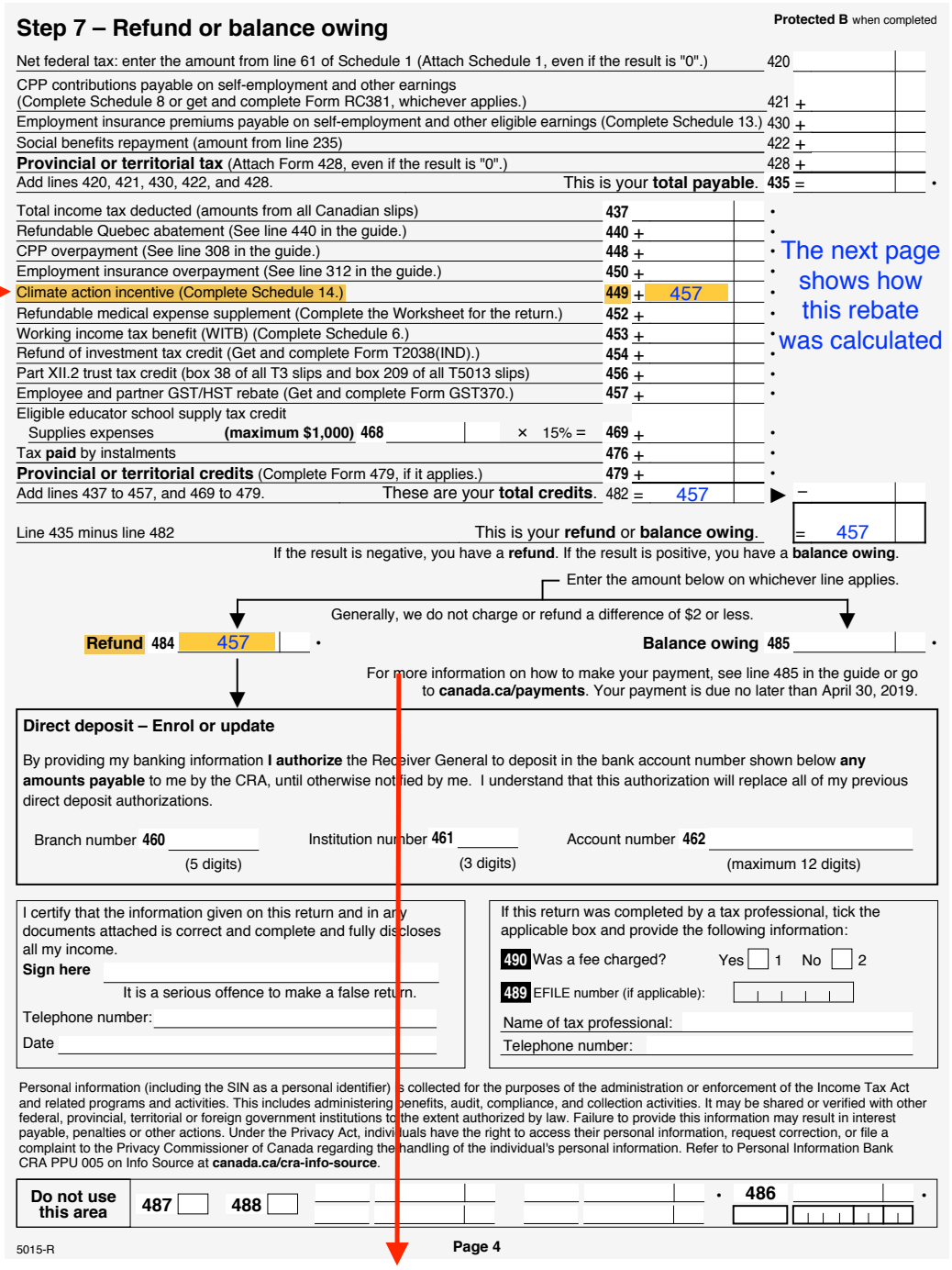


Figure A8: **Example of Messaging Treatment (page 3**

Next, respondents were asked to summarize the information they had just read.

About how much money in tax credits or rebates do you think you or your household (i.e. you, your spouse/common law partner, and any children who live primarily with you) received from the Climate Action Incentive ? [SLIDER from $0 to $1000]

All respondents in the treatment and control group were then asked the same bank of carbon pricing support questions.

13 Canada: Experimental Balance

Here we report balance checks between our treatment and control groups for wave 4. Respondents in the treatment group are identified as those returning panelists from Ontario and Saskatchewan who received a custom image of their tax return. The control group are identified as those returning panelists from federal carbon price provinces of Saskatchewan and Ontario who did not receive the treatment.

Note that all variables examined in these balance tests were measured pre-treatment (e.g. in waves 1 through 3).

Variable	Control Mean	Treatment Mean	DIM t-statistic	DIM p-value
Female (0/1)	0.54	0.53	0.046	0.964
Age (in years)	53.23	51.77	0.9903	0.322
Fraction with college degree	0.344	0.40	-1.2536	0.2106
Ideology	5.19	5.10	0.425	0.671
Trust in CRA	5.17	5.2	-0.112	0.911
Trust in federal government	4.27	4.06	0.812	0.417
Own home (0/1)	0.73	0.75	-0.453	0.651
Number of cars (0/5)	1.57	1.50	0.870	0.385
Perceived costs (heat and electricity)	3.04	3.09	-0.395	0.693
Perceived costs (gasoline and diesel)	3.14	3.15	-0.145	0.885

Note: CRA = Canada Revenue Agency

14 Canada: Experimental Manipulation Check

We checked the available data to examine if people in the treatment group updated the amount they thought they received from the carbon tax rebate after showing them exactly how much they should have received from the Climate Action Incentive (see example of Experimental Treatment in SI Section 12). We did do this in two ways.

A. A classic manipulation check would have compared perceived rebate amounts across treatment and control groups. However, this was not possible since the relevant post-treatment vari-

able was only asked to treated panelists in Ontario and Saskatchewan as part of the experiment. Later in the survey, a question on perceived rebate amount was asked to all respondents outside of Ontario and Saskatchewan, as well as to the 100 new respondents from Ontario and Saskatchewan that were included in wave 4 as a check for panel effects. We use these 100 new respondents from Ontario and Saskatchewan as a control group as they were drawn from the same federal tax province and were not "treated." As such, they give a sense of (untreated) baseline perceptions of the rebate size after having gone through the same survey in wave 4.

To compare these groups, we first re-coded the perceived rebate size post-treatment variable asked of the treatment group into the same categories used to measure perceived rebate size in the variable asked only of new panelists (i.e. the control group).

- \$0 = 0 (the minimum)
- \$1 through \$99= category 1
- \$100 through \$199 is set at category 2
- \$200 through \$299 is set as category 3
- ...
- \$1000 is set as category 11 (the maximum)

An independent sample T-test with unequal variances confirmed a significant difference between the two groups. Specifically, the 230 "treated" respondents (M=3.26; SD=2.20) compared to the 100 "control" group respondents (mean=1.97; SD=2.18) responded with significantly higher estimates of their carbon tax rebate (t-statistic = 4.9119, p > 0.0001).

B. Even stronger evidence of updating perceptions among treated respondents was found when comparing mean differences within the same individuals across waves. Here, we compared perceived rebate levels measured in wave 3 with those measured post-treatment. Again, because post-treatment rebate perceptions were measured on a different, more granular scale, we collapsed amounts and re-coded them to fit into the same categories.

Results from a ttest with unequal variances indicates that the information provided in the treatment resulted in an increase in perceived rebate size between wave 3 pre-treatment (M=2.25 ; SD1.97) and post-treatment (M=3.26; SD =2.20) measures, t(452) = 5.181, p ¡ 0.0001. Thus, on average, people in the treatment group updated the size of the perceived rebate from a mean corresponding to a range between \$100-\$199 to a mean corresponding to a range of between \$200-\$299.

That respondents in the treatment group updated says little about the accuracy of their updated perceptions, however. Follow up tests were performed to compare the rebate amount provided to treated participants as part of the experiment, and their subsequent estimate of how much they received from the Climate Action Incentive dividend. We found that among the 230 treated respondents, 88 (or 38%) underestimated the size of their rebate by $50 or more; 26 respondents (or 11%) overestimated the size of their rebate by $50 or more, and 116 (or 50%) recalled a figure that was within +/- $50 of the estimate provided to them as part of the experiment.

15 Switzerland: Experimental Treatment

In the Swiss survey, respondents were first asked about their knowledge about the current CO2 levy (see also SI Section 26) and then had to indicate their level of support for the scheme as well as for an increase in the levy.

In-between, the treatment group was provided specific information about the current system. Most important, we informed this group about the working of the refunding, namely that part of the revenues from the CO2 tax are refunded to the population through the health insurance bill The exact wording can be found in SI 23, page 67 "How dividend is paid back" and page 68, "Treatment"). Moreover, we showed this group a real world example of the document that recapitulates the dividend (SI Figure A10).

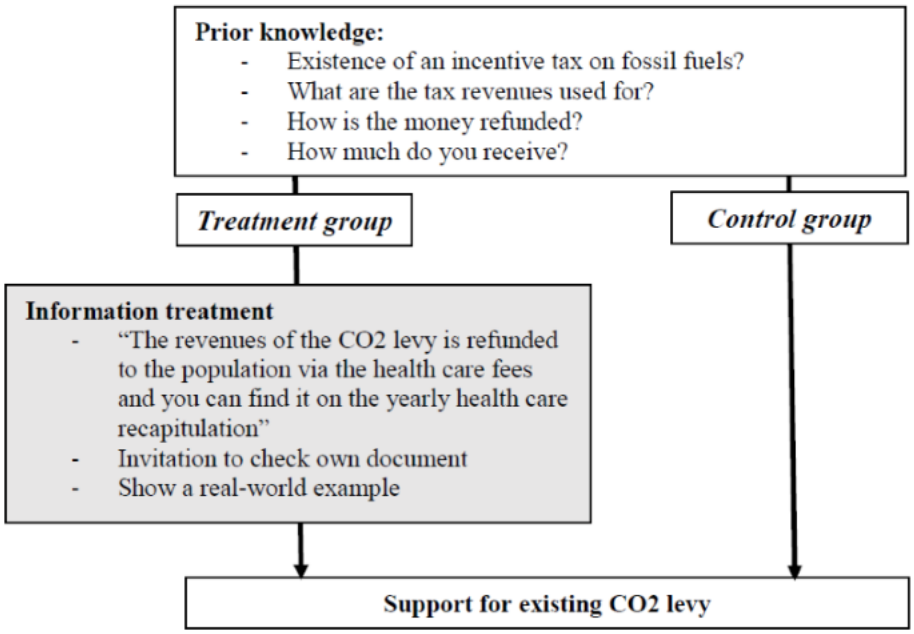
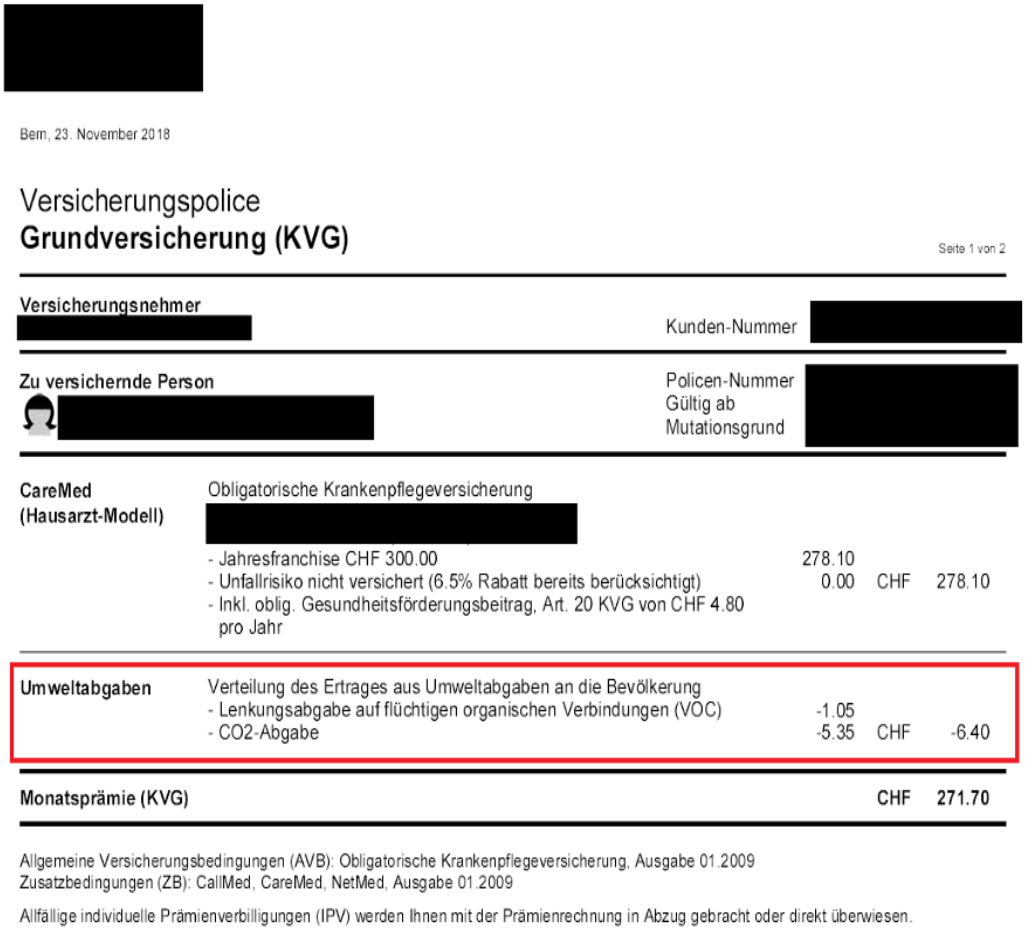


Figure A9: Design of the question block and experimental set-up



[redacted]

Bern, 23. November 2018

Versicherungspolice
Grundversicherung (KVG)

Seite 1 von 2

Versicherungsnehmer
[redacted]

Kunden-Nummer [redacted]

Zu versichernde Person
[redacted]

Policen-Nummer [redacted]
Gültig ab
Mutationsgrund

CareMed (Hausarzt-Modell)	Obligatorische Krankenpflegeversicherung [redacted]			
	- Jahresfranchise CHF 300.00	278.10		
	- Unfallrisiko nicht versichert (6.5% Rabatt bereits berücksichtigt)	0.00	CHF	278.10
	- Inkl. oblig. Gesundheitsförderungsbeitrag, Art. 20 KVG von CHF 4.80 pro Jahr			
Umweltabgaben	Verteilung des Ertrages aus Umweltabgaben an die Bevölkerung			
	- Lenkungsabgabe auf flüchtigen organischen Verbindungen (VOC)	-1.05		
	- CO2-Abgabe	-5.35	CHF	-6.40
Monatsprämie (KVG)			**CHF**	**271.70**

Allgemeine Versicherungsbedingungen (AVB): Obligatorische Krankenpflegeversicherung, Ausgabe 01.2009
Zusatzbedingungen (ZB): CallMed, CareMed, NetMed, Ausgabe 01.2009

Allfällige individuelle Prämienverbilligungen (IPV) werden Ihnen mit der Prämienrechnung in Abzug gebracht oder direkt überwiesen.

Figure A10: Rebate information was provided to Swiss citizens as a line item on their individual health insurance reports from their private insurance provider.

16 Switzerland: Experimental balance

Here we report balance checks between our treatment and control group in Switzerland. Respondents in the treatment group are identified as those who received information on the working of the CO2 levy in Switzerland and a custom image of their tax return and those who were asked to look up their health care bills. The control group are identified as those who did not receive the treatment.

	Control (N=533)	Treatment (N=517)	Total (N=1050)	DIM t-value (p-value)
Gender				
Male	253 (49.6%)	242 (48.9%)	495 (49.3%)	-0.2277 (0.8199)
Female	257 (50.4%)	253 (51.1%)	510 (50.7%)	-0.4761 (0.6341)
Age				
18 to 24	63 (12.4%)	69 (13.9%)	132 (13.1%)	0.743 (0.458)
25 to 34	76 (14.9%)	73 (14.7%)	149 (14.8%)	-0.0689 (0.945)
35 to 44	76 (14.9%)	70 (14.1%)	146 (14.5%)	-0.342 (0.732)
45 to 54	117 (22.9%)	110 (22.2%)	227 (22.6%)	-0.272 (0.786)
55 to 64	79 (15.5%)	76 (15.4%)	155 (15.4%)	-0.0599 (0.952)
65 to 74	76 (14.9%)	76 (15.4%)	152 (15.1%)	0.200 (0.842)
75+	23 (4.5%)	21 (4.2%)	44 (4.4%)	-0.207 (0.836)
Education				
N-Miss	2	0	2	
Sec. I	32 (6.3%)	42 (8.5%)	74 (7.4%)	1.321 (0.187)
Sec. II	284 (55.9%)	250 (50.5%)	534 (53.2%)	-1.7144 (0.087)
Tertiary	192 (37.8%)	203 (41.0%)	395 (39.4%)	1.0411 (0.298)
Knowledge CO2 levy				
Does not know	243 (47.6%)	225 (45.5%)	468 (46.6%)	-0.696 (0.486)
Knows	37 (7.3%)	34 (6.9%)	71 (7.1%)	0.819 (0.413)
Knows little	230 (45.1%)	236 (47.7%)	466 (46.4%)	-0.239 (0.811)
Belief climate change				
Mean (SD)	0.759 (0.428)	0.727 (0.446)	0.743 (0.437)	-1.144 (0.253)
Range	0.000 - 1.000	0.000 - 1.000	0.000 - 1.000	

Table A7: Check on experimental balance based on t-tests, Swiss sample. The variable "Knowledge CO2 levy" is an additive index of whether respondents gave the none, one, or two right answers regarding the existence of a CO2 levy and concerning the existence of a rebate.

17 Switzerland: Coding of parties

Based on common practise, individual party affiliations have been recoded into three categories:

Left parties:

- SPS (Social Democrats)
- GPS (Green Party)

- PdA (Communist Party)
- Sol. (SolidaritéS)

Centre parties:

- CVP (Christian Democratic Party)
- BDP (Conservative Democratic Party)
- GLP (Green Liberal)
- CSP (Christian-social party)
- EVP (Evangelical People's Party)

Right parties:

- SVP (Swiss People's Party
- FDP (The Liberals)
- EDU (Federal Democratic Union)
- Lega dei Ticinesi
- MCG (Mouvement Citoyens Genevois)

18 Canada: Partisan Differences in Political Ad Recollection

We explored whether partisans differed in their exposure to political advertisements regarding carbon pricing as of Wave 4. We find no significant difference between consistent Liberal (M=0.44; SD=0.50) and Conservative (M=0.48; SD=0.50) voters' self-reported exposure to political advertisements (t-test, unequal variances: t(374)=0.9245, p-value=0.3558). However, we do find a significant difference between Liberal (M=0.14; SD=0.35) and Conservative (M=0.22; SD=0.41) partisans in terms of their recollection of these ads being primarily negative (t-test, unequal variances: t(425)=2.113, p-value=0.0352). Moreover, Conservative partisans (M=0.16; SD=0.37) are about eight times more likely than Liberal voters (M=0.03; SD=0.16) to say that these ads impacted their views of carbon pricing (t=test, unequal variances: t(498)=5.6985, p-value < 0.001.

19 Canada: Partisan Accuracy of Post-Treatment Rebate Estimates

To evaluate partisan differences in the accuracy of perceived rebate amount post-treatment, we ran several exploratory tests.

A. We first examine the accuracy of post-treatment perceptions of size of carbon tax rebate. For this, we took the difference between the estimated size of the carbon tax rebate (presented to respondents as part of their customized tax form) and subsequent responses to the question "About how much money in tax credits or rebates do you think you or your household (i.e. you, your spouse/common law partner, and any children who live primarily with you) received from the Climate Action Incentive?" Responses were given on a slider between $0 to a maximum of $1000. After computing the difference in perceived vs. presented rebate amounts, we found perceptions varied widely from scores of -607 (indicating that a respondent provided an estimate that was $607 lower than the information provided to them in the tax form) to a maximum of 846 (indicating that a respondent provided an estimate that was $846 greater than the information provided to them in their customized tax form).

We then examined the extent to which the accuracy of these perceived rebate amounts was conditioned by partisanship. For this, we compared voters who indicated consistent support for the Conservative Party of Canada, and those indicating consistent support for the Liberal Party of Canada, across waves 3 and 4. These were identified as individuals indicating in wave 3 that if an election were held that day, they would vote for the Conservative (Liberal) Party of Canada and in wave 4 that they in fact voted for the Conservative (Liberal) Party of Canada on election day in October of 2019. Comparing post-treatment estimates between the two groups, we found consistent Liberals to be much more accurate (within $3 of the true, revealed value) than consistent Conservatives (mean underestimation of $72). In fact, a T-test of unequal variances confirms a significant difference between the "Consistent Liberal" (M=2.88; SD=126.36) and "Consistent Conservative" (M=-71.89; SD=198.01) voters in the treated sample, $t(89) = 2.347$, $p = 0.021$.

20 Canada: Exploring survey design effects

To measure potential design effects, we collected a random sample of new respondents during the first four survey waves (n=252 in wave 2, n=251 in wave 3, and n=250 in wave 4)). These respondents were randomly sampled across the five survey provinces in equal proportion, equivalent to our sampling procedure in the broader panel survey. We report top-line estimates for key survey variables in Table A8. These random samples are not included in any of the panel results reported in this article.

Table A8: **Comparing Panel Respondents to Independent Survey Samples by Wave**

	Wave 2		Wave 3		Wave 4	
Variable	Panel	New	Panel	New	Panel	New
% Ever heard of CP	94	89	94	89	95	92
% Heard medium or more about CP	66	64	68	65	65	59
% Support CP	46	46	44	45	NA	48
% Believe CP is fair	26	27	26	31	24	25
% Know status of CP in province	57	57	57	55	54	53

Note: Cells give percentage of respondents in each wave.

Not surprisingly, we find some design effects on respondents' having heard about carbon pricing debates, though these difference are both substantively modest and statistically insignificant. Given that respondents have answered one or more surveys about Canadian carbon pricing over the preceding months, this should be expected. More encouraging still, we find no significant design effects on a variety of other key tracking variables, which we present in Table A8. These include key measures of support for carbon pricing, belief that carbon pricing is fair, and knowledge about whether a provincial or federal carbon price is present in the respondent's province of residence. This suggests that participation in our panel survey is unlikely to be responsible, in and of itself, for over-time shifts in individual respondent beliefs about the policy.

We note, however, two important methodological points about the data in Table A8. First, we do not have benchmark data for the row "Support for Carbon Pricing" for wave 4, since our Ontario and Saskatchewan respondents were asked the identical question, but at a different point in the survey as part of an embedded survey experiment. Given this important difference, we exclude this data from the summary of new vs. returning panelists. Second, the "Know status of CP in province" was not asked in Alberta in wave 4. This is because of the complicated nature of the provincial Alberta carbon tax, which was repealed mid-study. This compositional change might explain the slight drop in knowledge regarding the status of carbon pricing in the provinces in wave 4 (bottom row Table A8) as Alberta residents tended to be more accurate

in correctly identifying the provincial level of government as responsible for the carbon price in their province (see Section 11 relative to the lower proportions of correct responses identified by respondents in the other provinces).

21 Canada: Sample representativeness

We can compare our province-level samples with base information on the adult population in each province from the 2016 census, presented as Table A9. Census data comes from Statistics Canada for age and sex (Table: 17-10-0005-01), language (Table: 98-400-X2016046), education (Table: 98-400-X2016242), household income (Table 98-400-X2016097) and individual income (Table: 98-400-X2016111). We find that our provincial samples are broadly representative of provincial characteristics including, age, gender, education and income. In the case of gender, respondents who indicated their gender was 'other' are not included in the table, resulting in sample gender splits not summing entirely to 100. In the case of language, respondents who speak a primary language other than French are bundled into the English category to best approximate the structure of the census question.

22 Canada: Consideration of panel attrition

The Canadian Climate Opinion Panel began with a large wave 1 oversample (n=3313) to ensure maintenance of a minimum sample size of 1000 respondents through wave 4. Over all four waves, we saw a cumulative attrition rate of 64%, leaving n=1190 respondents who completed all four survey waves. Attrition thus remained consistent with pre-survey expectations (see Table A10.) We subsequently we able to add a fifth wave, which yielded n=899 continuing respondents.

We also report demographic breakdowns by survey wave and between-wave attrition groups in Table A11. For example, the subgroup W1 Attrit describes the attributes of respondents who exited our panel between wave 1 and wave 2. The only attrition that is statistically significant is the fraction of the sample that is female in wave 4 vs. the group that attrited between wave 4 and wave 5 (indicated with an $*$, t-test with unequal variances, t-statistic=1.9928, p-value=0.0469). Gender, for all other waves, and all other variables across all waves do not show evidence of statistically significant attrition with respect to observable covariates.

	Census (2016)					Wave 1 sample				
	AB	BC	ON	QC	SK	AB	BC	ON	QC	SK
Gender										
Male	50.32	49.10	48.83	49.51	50.21	50.83	50.38	50.15	50.53	41.92
Female	49.68	50.90	51.17	50.49	49.79	48.72	49.47	49.70	49.32	57.78
Language										
English	97.55	98.28	95.52	21.14	98.06	95.78	95.46	95.45	18.91	96.71
French	2.45	1.72	4.48	78.86	1.94	4.22	4.54	4.55	81.09	3.29
Age										
18-34	32.90	27.86	28.58	26.20	31.09	28.05	28.48	29.55	27.84	26.80
35-54	36.10	33.52	34.42	33.67	32.79	36.05	38.48	38.03	37.22	34.28
55 and older	31.00	38.62	37.00	40.12	36.12	35.90	33.03	32.42	34.95	38.92
Education										
Less than high school	13.16	12.32	14.01	17.48	16.48	3.32	2.42	2.58	5.75	3.74
High school	27.47	28.94	26.81	20.50	30.75	17.35	13.92	13.64	20.42	23.35
Some college	34.12	32.38	31.12	40.09	33.24	46.00	47.66	44.39	40.70	40.57
College	17.84	17.23	18.67	14.05	14.26	24.13	24.05	28.48	23.75	22.90
Graduate or prof. degree	7.40	9.12	9.39	7.89	5.27	9.20	11.95	10.91	9.38	9.43
Household income										
Less than 20,000	5.65	10.83	9.22	11.44	8.60	6.96	10.53	8.80	11.84	8.66
20,000-40,000	11.74	16.37	15.48	19.91	15.91	14.26	16.98	14.61	15.40	14.60
40,000-60,000	12.36	15.73	15.43	18.80	15.13	13.57	17.49	16.90	20.30	20.20
60,000-80,000	12.29	13.56	13.53	14.60	13.24	18.43	14.77	14.26	13.87	14.09
80,000-100,000	11.35	11.20	11.45	10.90	11.35	15.30	18.00	14.44	14.55	17.32
100,000 and over	46.62	32.30	34.90	24.35	35.76	31.48	22.24	30.99	24.03	25.13

Table A9: **Comparison of provincial wave 1 panel samples with census demographic benchmarks.** Census data comes from the 2016 Canadian census and refers to adult population. All data presented as percentages (%)

Table A10: **Respondent Attrition Across Survey Waves**

Wave	**# Responses**	**% Attrition Relative to Previous Wave**	**% Attrition Relative to Wave 1 Sample**
1	3313	–	–
2	2189	34	34
3	1509	31	54
4	1190	21	64
5	899	24	73

Table A11: **Respondent Attributes by Survey Wave and Attrition Groups**

Variable	**W1**	**W1 Attrit**	**W2**	**W2 Attrit**	**W3**	**W3 Attrit**
Fraction Female	0.51	0.50	0.51	0.55	0.51	0.49
Fraction French-speaking	0.19	0.20	0.19	0.18	0.20	0.19
Mean Household Income	$79,524	$82,374	$78,047	$75,574	$79,176	$81,527
Fraction Bachelors or more	0.35	0.33	0.36	0.35	0.36	0.37
n	3313	1124	2189	680	1509	319
Variable	**W4**	**W4 Attrit**	**W5**			
Fraction Female	0.50	0.44*	0.52			
Fraction French-speaking	0.20	0.25	0.19			
Mean Household Income	$78,556	$83,582	$76,876			
Fraction Bachelors or more	0.35	0.38	0.35			
n	1190	291	899			

23 Canada: Details on Canadian rebate calculations

Climate Action Incentive rebates are a deterministic function of place of residence and family size. First, residents of each province have a different base rebate amount, that is set each year as a function of federal carbon tax revenue collected in that province (revenue is recycled within provinces to ensure that residents in provinces with more carbon-intensive economic activity receive higher rebates). In 2019, this base amount was $154 in Ontario and $305 in Saskatchewan. If a household has one dependent (either a spouse or, for unmaried taxpayers, a child), they receive a supplement to this rebate that is valued at half the base rebate, $77 for Ontario taxpayers and $152 for Saskatchewan taxpayers. For every additional dependent beyond this, the household receives an additional supplement equal to one quarter of the base rate, or $38 for Ontario taxpayers and $76 for Saskatchewan taxpayers. Finally, residents who live outside a Census Metropolitan Area (CMA) receive a 10% bonus on their full rebate amount.

For example, a married couple with three children in rural Saskatchewan would receive a Climate Action Incentive of $753.50. This comes from $305 for the primary tax filer, $152 for their spouse and $76*3=$228 for their dependent children (i.e., children who primarily reside in that household), all multiplied by 1.1 because they live outside a CMA.

24 Canada: Survey Instrument

In this section, we give the full question wording for all parts of the CCCP analyzed in this research paper. We use W1, W2, W3 and W4 to indicate the wave(s) in which a given question was asked.

Language Choice [W1, W2, W3, W4]

Préféreriez-vous répondre à ce questionnaire en anglais ou en français ? / Would you prefer to complete the survey in English or French?

- English
- Français

Province [W1, W2, W3, W4]

In which province or territory do you live?

Gender [W1, W2, W3, W4]

Do you identify as:

- Male
- Female
- Other

Age [W1, W2, W3, W4]

Please indicate your age in years.

Heard about carbon pricing [W1, W2, W3, W4]

As you may have heard, some provinces have agreed to work with the federal government to address climate change by raising the price of fossil fuels like coal, oil and gas. Other provinces have opposed the federal government's plan. How much have you heard about this issue?

- A lot
- A moderate amount

- A little
- Nothing at all

Carbon pricing support [W1, W2, W3, W4]

Based on what you know, how do you feel about putting a price or tax on fossil fuels like coal, oil and gas in order to reduce carbon emissions in Canada? This type of policy is often referred to as 'carbon pricing'.

- Strongly support
- Somewhat support
- Somewhat oppose
- Strongly oppose
- Not sure

Carbon pricing knowledge [W1, W2, W3, W4]

As part of the federal government's efforts to address climate change, some provinces will have their carbon price set by the federal government, while others will have their policies set by their provincial government.

As far as you know, which level of government is administering the carbon price in your province?

- The federal government
- The provincial government
- There is no carbon price (W3 in Alberta only)
- Not sure

Perceived provincial position [W1, W2, W3, W4]

To the best of your knowledge, does your provincial government support or oppose the federal government's efforts to create a coordinated national carbon price?

- My province supports the federal government's plan

- My province opposes the federal government's plan
- Not sure

Knowledge of rebate [W4]

Do you believe your household (i.e. your spouse/common law partner, and any children who live primarily with you) has received any money back from the government because of the carbon tax or price in your province?

- Yes
- No
- Not sure

Estimated climate dividend [W3, W4]

What is the value, if any, of carbon tax or levy rebates via 2018 tax returns to you, your spouse, and dependent family members that primarily live with you?

Please estimate the value to the household regardless of whether you or a spouse claimed any available credit for your family in their tax return.

- $0
- $1-100
- $100-200
- $200-300
- $300-400
- $400-500
- $500-600
- $600-700
- $700-800
- $800-900
- $900-1000
- $1000+

Estimated climate dividend for treated respondents only [W4]

About how much money in tax credits or rebates do you think you or your household (i.e. you, your spouse/common law partner, and any children who live primarily with you) received from the Climate Action Incentive?

[Sliding scale from $0 to $1000]

Perceived sufficiency of rebate [W4]

Relative to what my household paid as a result of the carbon tax, the carbon tax /emphrebate (also known as the Climate Action Incentive):

- Is greater than what my household paid.
- Is about the same as what my household paid.
- Is less than what my household paid

Exposure to partisan discourse [W4]

Have you seen or heard any political advertisements concerning carbon pricing?

On television

On the radio

Online

- Yes
- No
- Can't remember

Type of political advertisements [W4]

From what you remember, were these ads about carbon pricing:

- Mostly positive
- Mostly negative
- Fairly balanced (with arguments on both sides)
- Neutral
- Don't know

Impact of advertisements [W4]

What impact, if any, have these ads had on your opinion of carbon pricing?

- These ads have made me more supportive
- These ads have made me less supportive
- These ads have had no impact on my opinion
- Not sure

Party Preference [W1, W2, W3, W4]

If a federal election were held today, which party would you vote for?

- Green Party
- Liberal Party
- Conservative Party
- NDP
- People's Party
- Bloc Québécois
- I would not vote

Marital status for tax purposes [W1]

Do you live with a spouse or common law partner?

- Yes
- No

Number of children for tax purposes [W3]

How many children did EITHER you OR YOUR SPOUSE, IF APPLICABLE, claim as dependents in your most recent tax return?

- 0

- 1
- 2
- 3
- 4
- 5
- 6
- 7 or more

25 Switzerland: Sample representativeness

We compare the Swiss national sample with base information on the adult population in Switzerland from the Federal Statistical Office for the year 2019., presented as Table A12. For gender, age, and home canton canton, we rely on the Federal Statistical Office's "STAT-TAB – interactive tables" (`https://www.pxweb.bfs.admin.ch/pxweb/en/`). Concerning education, we use Fthe Federal Statistical Office's "Bildungsindikatoren Bildungsstand der Bevölkerung – Daten des Indikators" (`https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/bildungsindikatoren/themen/wirkung/bildungsstand.assetdetail.16324563.html`). We find that our Swiss sample is broadly representative of the respective population characteristics while, however and as typical in public opinion surveys, the lowest educational group as well as the oldest age groups are slightly under-represented.

	Sample	Swiss population
Gender		
Female	50.0%	50.4%
Male	50.0%	49.6%
Age		
18-24 years	12.6%	9.3%
25-34 years	14.5%	16.7%
35-44 years	14.1%	17.1%
45-54 years	21.9%	18.0%
55- 64 years	15.9%	16.2%
65-74 years	16.5%	11.8%
75+ years	4.6%	11.0%
Home canton		
Aargau	7.7%	8.0%
Appenzell-Ausserrhoden	0.6%	0.6%
Appenzell-Innerrhoden	0.3%	0.2%
Basel-Landschaft	3.1%	3.4%
Basel-Stadt	1.5%	2.3%
Bern	11.6%	12.1%
Freiburg	3.6%	3.7%
Genève	6.4%	5.9%
Glarus	0.4%	0.5%
Graubünden	1.8%	2.3%
Jura	1.0%	0.9%
Luzern	4.8%	4.8%
Neuchâtel	3.3%	2.1%
Nidwalden	0.8%	0.5%
Obwalden	0.2%	0.4%
Schaffhausen	0.8%	1.0%
Schwyz	1.4%	1.9%
Solothurn	3.8%	3.2%
St. Gallen	5.6%	5.9%
Ticino	1.5%	4.1%
Thurgau	2.8%	3.2%
Uri	0.3%	0.4%
Valais	5.6%	4.0%
Vaud	14.2%	9.4%
Zug	1.3%	1.5%
Zürich	15.5%	17.9%
Education		
Sec. I	7.3%	11.0%
Sec. II	53.2%	44.6%
Tertiary	39.5%	44.2%

Table A12: Comparison of Swiss sample with official demographic benchmarks

26 Switzerland: Survey Instrument

In this section, we give the full question wording (English translation) for all parts of the survey analyzed in this research paper.

Age

What is your age?

- 18 - 24 years
- 25 - 34 years
- 35 - 44 years
- 45 - 54 years
- 55 - 64 years
- 65 - 74 years
- 75+ years
- Don't know / no answer

Gender

What is your gender?

- Female
- Male
- Other
- No answer

Canton

In which canton to you live (main place of residence)?

[Dropdown list of the 26 cantons]

Introduction to the CO2 levy module

In the following, we want to ask you some question about ecological taxes. These taxes are very complex and studies show that a majority of the population does not know exactly how they work. One reason is that there is barely a public discussion on these issues. So just answer to the best of your knowledge.

Knowledge about the existence of the CO2 levy

One possible instrument for achieving climate policy goals is incentive taxes. These are taxes that do not aim to generate revenue. Rather, they are intended to reduce the consumption of undesirable substances or products. Do you know which incentive taxes are currently in place in Switzerland?

- Incentive tax on fossil fuels (Is in place / Is currently not in place / Don't know)
- Incentive tax on gasoline (Is in place / Is currently not in place / Don't know)
- Incentive tax on air traffic tickets (Is in place / Is currently not in place / Don't know)

Revenue recycling CO2 levy

In Switzerland, we have a typical incentive tax in the form of the CO2 tax. The CO2 tax on fossil fuels such as heating oil or natural gas (today 25 cents per liter of heating oil) provides incentives for economical consumption and increased use of CO2-neutral or low-CO2 energy sources. What is the revenue from this levy used for? The revenues...

- ...are largely used to promote renewable energy.
- ...flow largely into the general federal treasury.
- ...are largely redistributed to the population and the economy.
- Don't know

How dividend is paid back

Most of the revenue from the CO2 tax is distributed back to the population and the economy, irrespective of consumption. Do you know how this money is redistributed?

- as cantonal tax refund
- as national tax refund
- through the health care bill
- through the electricity bill
- by funding the old age insurance
- Don't know

Size of rebate

Do you know approximately how much you personally get back per month?

- Nothing
- less than 3 CHF
- between 3 and 10 CHF
- between 10 and 15 CHF
- Don't know / no answer

Treatment (Randomized assignment)

The refund of the CO2 tax is made as a deduction from the health insurance bill and is shown by the health insurance companies on the annual summary. If you have the corresponding document from the health insurance company at hand in a few minutes, we invite you to take a quick look there to see how much you will receive back each month this year. Please take the time to look up this information before proceeding with the survey.

Treatment example (Randomized assignment)

Below we show you a typical example of such an overview.

Image as shown in Figure A10

Support current scheme

Do you agree **in principle** with the levying of the CO2 tax?

- Agree
- Rather agree
- Rather disagree
- Disagree
- Don't know / no answer

Support for tax increase

Would you support an increase in the CO2 tax from 25 to [28 / 40] cents per liter of heating oil in order to provide even stronger incentives to reduce the consumption of fossil fuels?
(Amount in bracket, i.e., the increase was randomly varied among respondents)

- Agree
- Rather agree
- Rather disagree
- Disagree
- Don't know / no answer

Income

We would like to obtain information about your net monthly household income. Take into account your salary or pension, but also the income of all other people living in the same household. Your answer will be treated as strictly confidential.

- less than 5000 CHF
- 5001 up to 7000 CHF
- 7001 up to 9000 CHF
- 9001 up to 13000 CHF
- more than 13001 CHF

Highest level of education

What is the highest education you have completed with a certificate or diploma?

- No education completed
- I am still in compulsory school
- Compulsory school
- Transitional education (e.g. apprenticeship, 10th school year, budget year, language school with certificate)

- Vocational education, BMS, full-time vocational school (commercial college/apprenticeship workshop)
- Vocational baccalaureate
- General education school without Matura
- Matura, teachers' seminar
- Higher vocational training with master diploma, federal certificate
- Technical or vocational college (2 years full or 3 years part time)
- Higher technical college/university of applied sciences, HTL, HMV (3 years full- or 4 years part-time)
- University, ETH, University of Applied Sciences, University of Education
- Don't know / no answer

Party affiliation

Which party's goals and demands most closely match your own views and desires?

- SVP (Swiss People's Party
- SPS (Social Democrats)
- FDP (The Liberals)
- CVP (Christian Democratic Party)
- GPS (Green Party)
- GLP (Green Liberal)
- BDP (Conservative Democratic Party)
- EVP (Evangelical People's Party)
- Lega dei Ticinesi
- PdA (Communist Party)
- MCG (Mouvement Citoyens Genevois)
- CSP (Christian-social party)

- EDU (Federal Democratic Union)
- Sol. (SolidaritéS)
- Other
- None
- Don't know / no answer

27 Switzerland: Variables and descriptive statistics

	Overall (N=1050)
Treatment 1	
Control	510 (50.7%)
Treatment	495 (49.3%)
Missing	45
Knowledge about the existence a CO2 levy	
No	184 (17.5%)
Yes	514 (49.0%)
Don't know	352 (33.5%)
Knowledge about revenue recycling	
Largely go to governmental spending	295 (28.1%)
Largely redistributed to the population and the economy	124 (11.8%)
Largely used to promote renewable energy	373 (35.5%)
Don't know	258 (24.6%)
Knowledge about how rebate is redistributed	
Correct	154 (14.7%)
Incorrect	896 (85.3%)
Knowledge about size of rebate	
Correct	136 (13.0%)
Incorrect	914 (87.0%)
Missing	0
Prior knowledge (Index)	
Does not know	488 (46.5%)
Knows little	486 (46.3%)
Knows	76 (7.2%)
Gender	
Female	525 (50.0%)
Male	525 (50.0%)
Age	
18 to 24	132 (12.6%)
25 to 34	152 (14.5%)
35 to 44	148 (14.1%)
45 to 54	230 (21.9%)
55 to 64	167 (15.9%)
65 to 74	173 (16.5%)
75+	48 (4.6%)

Table A13: Variables and descriptive statistics

Home canton	
Aargau	81 (7.7%)
Appenzell-Ausserrhoden	6 (0.6%)
Appenzell-Innerrhoden	3 (0.3%)
Basel-Landschaft	33 (3.1%)
Basel-Stadt	16 (1.5%)
Bern (German)	98 (9.3%)
Berne (French)	24 (2.3%)
Freiburg (German)	5 (0.5%)
Fribourg (French)	33 (3.1%)
Genf	67 (6.4%)
Glarus	4 (0.4%)
Graubünden/Grischun	19 (1.8%)
Jura	11 (1.0%)
Luzern	50 (4.8%)
Neuchâtel	35 (3.3%)
Nidwalden	8 (0.8%)
Obwalden	2 (0.2%)
Schaffhausen	8 (0.8%)
Schwyz	15 (1.4%)
Solothurn	40 (3.8%)
St. Gallen	59 (5.6%)
Tessin	16 (1.5%)
Thurgau	29 (2.8%)
Uri	3 (0.3%)
Valais (French)	53 (5.0%)
Waadt	149 (14.2%)
Wallis (German)	6 (0.6%)
Zug	14 (1.3%)
Zürich	163 (15.5%)
Education	
Sec. I	76 (7.3%)
Sec. II	558 (53.2%)
Tertiary	414 (39.5%)
Missing	2
Income	
Low	371 (35.8%)
Middle	481 (46.5%)
High	183 (17.7%)
Missing	15
Belief in anthropogenic climate change	
Mean (SD)	0.747 (0.435)
Median (Q1, Q3)	1.000 (0.000, 1.000)
Min - Max	0.000 - 1.000