

# Citizens' climate change attitudes across the four Croatian regions

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# Citizens' climate change attitudes across the four Croatian regions

Marina Maglić, Tomislav Pavlović, & Renata Franc



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Why?



- Scientific consensus on the issue of human influence on climate change well-established
- Public opinion varies; digital media abounds with information that often contradicts scientific findings

Taken from <https://science.nasa.gov/climate-change/effects/>, left - Mike McMillan/USFS, center - Tomas Castelazo / Wikimedia Commons / CC BY-SA 4.0, right – NASA, 27 August 2024

## • Croatia?

Sep 22, 2019 - Croatian youth joins climate change movement - taken from <https://www.thedubrovniktimes.com/news/croatia/item/7435-croatian-youth-joins-climate-change-movement>, 27 August 2024





- 1. Descriptively compare Croatia's climate change attitudes to those in other countries participating in the 10th wave (2020-2022) of the European Social Survey (ESS)**
- 2. Examine Croatian regional differences in climate change attitudes across four distinct areas: Mediterranean Croatia, Pannonian Croatia, Northern Croatia, and the capital, Zagreb (variations in historical, cultural, economic, and climatic aspects).**



## Sample & procedure

### 10th wave of the European Social Survey

- Fieldwork: September 2020 - August 2022
- **37,611 participants across 22 countries**
- **Croatia**
  - $N = 1592$  (55% ♂)
  - Age: 16 - 89;  $M = 50$  (median = 51;  $SD = 18.78$ )

Who?  
When? Where?

Country	<i>N</i>
Belgium	1341
Bulgaria	2718
Switzerland	1523
Czechia	2476
Estonia	1542
Finland	1577
France	1977
United Kingdom	1149
Greece	2799
Croatia	1592
Hungary	1849
Ireland	1770
Iceland	903
Italy	2640
Lithuania	1659
Montenegro	1278
North Macedonia	1429
Netherlands	1470
Norway	1411
Portugal	1838
Slovenia	1252
Slovakia	1418



## Measures - criteria

How?

- **Impenv** [1] “Now I will briefly describe some people. Please listen to each description and tell me how much each person is or is not like you. Use this card for your answer. She/he strongly believes that people **should care for nature. Looking after the environment is important** to her/him.” → **IMPORTANCE**
  - 1 - Very much like me 1; 6 - Not like me at all
- **wrc1mch** [1] “**How worried** are you about climate change?” → **CC CONCERN**
  - 1 - Not at all worried, 2 - Not very worried, 3 - Somewhat worried, 4 - Very worried, 5 - Extremely worried
- **ccrdprs** [1] “To what extent **feel personal responsibility** to reduce climate change” → **PERSONAL RESPONSIBILITY**
  - 0 - Not at all; 10 - A great deal
- **ccnthum** [1] “Do you think that **climate change is caused** by **natural** processes, **human activity**, or both?” → **CC ATTRIBUTION**
  - 1 - Entirely by natural processes
  - 2 - Mainly by natural processes
  - 3 - About equally by natural processes and human activity
  - 4 - Mainly by human activity
  - 5 - Entirely by human activity





# Measures - IVs

How?

- Croatian regions

<b>Panonian</b>	Bjelovarsko-bilogorska županija Virovitičko-podravska županija Požeško-slavonska županija Brodsko-posavska županija Osječko-baranjska županija Vukovarsko-srijemska županija Karlovačka županija Sisačko-moslavačka županija
<b>Mediterranean</b>	Primorsko-goranska županija Ličko-senjska županija Zadarska županija Šibensko-kninska županija Splitsko-dalmatinska županija Istarska županija Dubrovačko-neretvanska županija
<b>Zagreb</b>	Grad Zagreb
<b>Northern</b>	Međimurska županija Varaždinska županija Koprivničko-križevačka županija Krapinsko-zagorska županija Zagrebačka županija

- Control Variables:

- gender (gndr)
- age (agea)
- education (eisced) - highest level of education
- type of place of residence (domicil) – 1 - a big city; 2 - suburbs or outskirts of big city; 3 - town or small city; 4 - country village; 5 - farm or home in countryside



- Descriptives and regressions
- Programme R







What did we get?

# Results



Taken from <https://tenor.com/view/homero-cerebro-anteojos-lentes-gif-21341134>, 7 June 2024

# Country descriptives

## CC concern

	<i>M</i>	<i>SD</i>
1 PT	3.57	0.85
2 SI	3.47	0.88
<b>3 HR</b>	<b>3.38</b>	<b>1.04</b>
4 GB	3.35	0.96
5 HU	3.34	0.79
6 MK	3.33	0.94
7 CH	3.32	0.89
8 BE	3.27	0.95
9 NL	3.26	0.91
10 FR	3.25	0.93
11 IT	3.23	0.88
12 FI	3.17	0.84
13 LT	3.16	0.99
14 GR	3.15	0.94
15 IE	3.13	0.96
16 CZ	3.13	1.13
17 ME	3.13	0.98
18 NO	3.10	0.86
19 BG	3.09	0.96
20 IS	3.06	0.97
21 EE	2.99	0.91
22 SK	2.85	0.94

1 – 5 ratings

## Importance

	<i>M</i>	<i>SD</i>
1 SI	1.73	0.75
2 IT	1.96	0.95
3 FI	1.99	0.93
4 EE	2.00	0.94
5 CH	2.01	0.93
6 BE	2.08	0.94
<b>7 HR</b>	<b>2.10</b>	<b>1.08</b>
8 GB	2.12	1.07
9 IE	2.13	1.04
10 HU	2.19	0.97
11 FR	2.20	1.13
12 NL	2.21	0.92
13 BG	2.29	1.11
14 SK	2.30	1.05
15 GR	2.34	1.02
16 MK	2.37	1.12
17 ME	2.38	1.19
18 IS	2.39	1.18
19 PT	2.44	1.02
20 NO	2.50	1.15
21 CZ	2.52	1.23
22 LT	2.62	1.19

1 – 6 ratings\*

## CC attribution

	<i>M</i>	<i>SD</i>
1 GR	3.69	0.86
2 IT	3.62	0.84
3 IS	3.62	0.81
4 FR	3.60	0.79
5 FI	3.59	0.76
6 NL	3.58	0.78
7 BE	3.57	0.81
8 CH	3.57	0.78
9 GB	3.55	0.79
10 PT	3.54	0.76
<b>11 HR</b>	<b>3.50</b>	<b>0.86</b>
12 SK	3.46	0.85
13 HU	3.44	0.76
14 SI	3.44	0.76
15 IE	3.38	0.84
16 NO	3.38	0.76
17 BG	3.36	0.92
18 CZ	3.34	0.86
19 EE	3.33	0.78
20 LT	3.32	0.88
21 MK	3.21	1.04
22 ME	3.19	0.86

1 – 5 ratings

## Personal responsibility

	<i>M</i>	<i>SD</i>
1 FR	7.44	2.11
2 CH	7.28	1.99
3 GB	7.14	2.20
4 PT	6.88	2.50
5 FI	6.79	2.38
6 NO	6.75	2.02
7 IE	6.69	2.31
8 IS	6.63	2.41
9 NL	6.55	2.09
10 SI	6.41	2.63
11 BE	6.38	2.39
12 LT	6.04	2.63
13 IT	5.88	2.37
14 HU	5.80	2.34
15 EE	5.56	2.87
<b>16 HR</b>	<b>5.46</b>	<b>3.06</b>
17 GR	5.45	2.15
18 SK	4.87	2.52
19 BG	4.83	2.91
20 MK	4.51	3.06
21 CZ	4.32	2.86
22 ME	4.06	2.70

1 – 10 ratings

# Regional differences

1. Mediterranean Croatia ( $n = 526$ , 33%)
2. Northern Croatia ( $n = 353$ , 22%)
3. Zagreb ( $n = 254$ , 16%)
4. Pannonian Croatia ( $n = 459$ , 29%)

## Importance

Region	$n$	$M$	$SD$	Median	Min	Max	Skew	Kurtosis
Mediterranean	523	1.91	1.00	2	1	6	1.22	1.63
Pannonian	451	2.08	1.01	2	1	6	0.91	0.48
Zagreb	251	2.18	1.09	2	1	5	0.77	-0.20
Northern	343	2.26	1.20	2	1	6	1.14	1.02

## Importance

Predictor	$b$	$SE(b)$	95% CI for $b$	$t$	$\beta$	$SE(\beta)$	$p$
(Intercept)	2.98	0.16	(2.67, 3.29)	18.90	NA	NA	.000 ***
Northern	0.29	0.08	(0.14, 0.44)	3.71	.11	0.08	.000 ***
Zagreb	0.20	0.10	(0.01, 0.38)	2.05	.07	0.10	.040 *
Pannonian	0.13	0.07	(-0.01, 0.26)	1.85	.05	0.07	.065 .
gender	-0.25	0.05	(-0.36, -0.15)	-4.67	-.12	0.05	.000 ***
age	-0.01	0.00	(-0.01, -0.01)	-6.10	-.15	0.00	.000 ***
education	-0.04	0.01	(-0.06, -0.02)	-3.68	-.09	0.01	.000 ***
type of residence	-0.02	0.03	(-0.07, 0.04)	-0.53	-.02	0.03	.595

## CC concern

Region	$n$	$M$	$SD$	Median	Min	Max	Skew	Kurtosis
Northern	348	3.48	1.04	3	1	5	-0.25	-0.26
Pannonian	459	3.41	1.04	3	1	5	-0.33	-0.21
Zagreb	254	3.38	1.09	3	1	5	-0.22	-0.48
Mediterranean	522	3.35	0.96	3	1	5	-0.23	0.05

## CC concern

Predictor	$b$	$SE(b)$	95% CI for $b$	$t$	$\beta$	$SE(\beta)$	$p$
(Intercept)	2.58	0.15	(2.28, 2.88)	17.03	NA	NA	.000 ***
Northern	0.16	0.07	(0.02, 0.31)	2.18	.06	0.07	.029 *
Zagreb	-0.03	0.09	(-0.21, 0.15)	-.34	-.01	0.09	.738
Pannonian	0.11	0.07	(-0.02, 0.24)	1.70	.05	0.07	.089 .
gender	0.26	0.05	(0.16, 0.37)	5.04	.13	0.05	.000 ***
age	0.01	0.00	(0.01, 0.01)	6.41	.16	0.00	.000 ***
education	0.01	0.01	(-0.01, 0.03)	1.03	.03	0.01	.301
type of residence	-0.05	0.03	(-0.1, 0.01)	-1.65	-.05	0.03	.098 .

# Regional differences

1. Mediterranean Croatia ( $n = 526$ , 33%)
2. Northern Croatia ( $n = 353$ , 22%)
3. Zagreb ( $n = 254$ , 16%)
4. Pannonian Croatia ( $n = 459$ , 29%)

## Personal responsibility

Region	$n$	$M$	$SD$	Median	Min	Max	Skew	Kurtosis
Pannonian	454	5.91	2.85	6	0	10	-0.46	-0.42
Mediterranean	512	5.64	2.99	6	0	10	-0.38	-0.70
Zagreb	253	5.43	3.15	5	0	10	-0.24	-0.92
Northern	346	4.94	3.21	5	0	10	-0.10	-1.07

## Personal responsibility

Predictor	$b$	$SE(b)$	95% CI for $b$	$t$	$\beta$	$SE(\beta)$	$p$
(Intercept)	4.14	0.45	(3.26, 5.01)	9.27	NA	NA	.000 ***
Northern	-0.51	0.22	(-0.94, -0.08)	-2.34	-.07	0.22	.019 *
Zagreb	-0.50	0.27	(-1.03, 0.03)	-1.85	-.06	0.27	.064 .
Pannonian	0.46	0.20	(0.07, 0.85)	2.32	.07	0.20	.020 *
gender	0.81	0.15	(0.51, 1.11)	5.26	.13	0.15	.000 ***
age	0.00	0.00	(0, 0.01)	.83	.02	0.00	.406
education	0.13	0.03	(0.08, 0.19)	4.75	.12	0.03	.000 ***
type of residence	-0.19	0.08	(-0.36, -0.03)	-2.29	-.07	0.08	.022 *

## CC attribution

Region	$n$	$M$	$SD$	Median	Min	Max	Skew	Kurtosis
Mediterranean	515	3.56	0.85	3	1	5	0.07	-0.22
Northern	343	3.56	0.94	3	1	5	-0.09	-0.16
Zagreb	253	3.47	0.81	3	1	5	-0.03	0.59
Pannonian	456	3.43	0.79	3	1	5	-0.03	0.85

## CC attribution

Predictor	$b$	$SE(b)$	95% CI for $b$	$t$	$\beta$	$SE(\beta)$	$p$
(Intercept)	3.50	0.13	(3.25, 3.75)	27.57	NA	NA	.000 ***
Northern	0.03	0.06	(-0.09, 0.15)	.47	.01	0.06	.640
Zagreb	0.02	0.08	(-0.13, 0.17)	.31	.01	0.08	.755
Pannonian	-0.07	0.06	(-0.18, 0.04)	-1.31	-.04	0.06	.191
gender	-0.03	0.04	(-0.11, 0.06)	-.60	-.02	0.04	.547
age	0.00	0.00	(0, 0)	.12	.00	0.00	.907
education	0.00	0.01	(-0.02, 0.01)	-.55	-.01	0.01	.580
type of residence	0.02	0.02	(-0.03, 0.07)	0.84	.03	0.02	.401



Can you  
recap?

## Main findings

- Compared to other European nations, Croatians ...
  - ... are one of the nations **most concerned about climate change** (see also Cik & Vlašić, 2022; ISPP, 2023, Nefat & Benazić, 2019, Vrselja et al., 2024)
  - ... ranking in the top third regarding the **importance of care for nature and the environment**
  - ... rank in the middle regarding the **attribution of CC to human vs. natural processes**
  - ... in terms of **perceived personal responsibility** to combat climate change just enter the the lowest third of the investigated countries
- **Significant regional variations** → might prove relevant for crafting targeted public engagement and mitigation strategies
  - Citizens of the **Mediterranean** region placed **higher importance** on nature and the environment compared to citizens of other regions (marginally compared to *Pannonian residents*).
  - Citizens of **Northern Croatia** showed **greater concern** about climate change than those in the **Mediterranean** region.
  - **Northern Croatian** citizens reported the lowest levels of **personal responsibility** for addressing climate change.
  - No significant differences were found in **attributing climate change** to natural vs. human activities across the regions.

## Limitations & looking ahead

- Other relevant variables not considered
- Correlational, cross-sectional study
- Experimental, repeated, and longitudinal studies needed

Summary &  
conclusions



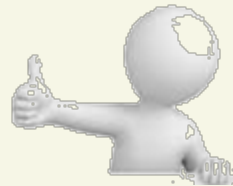
# DISINFO klima



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Thank you 😊

**For any questions, comments, criticism or suggestions, feel free to contact us!**



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