

THE PUBLIC GOOD VALUE OF FCC

6 June 2023

FCC Week 2023

Millennium Gloucester Hotel London Kensington



FCCIS – The Future Circular Collider Innovation Study. This INFRADEV Research and Innovation Action project receives funding from the European Union's H2020 Framework Programme under grant agreement no. 951754. The information herein only reflects the views of its authors and the European Commission is not responsible for any use that may be made of the information.

The public good value in practise: three main questions

1

What do the laypeople think about CERN and its scientific research?

Is the public aware of CERN?

2

How much a Future Circular Collider (FCC) research programme is worth to a layperson?

Is society willing to give the opportunity to continue with discovery, which is uncertain and costly?

3










If a perceived value exists, what are the drivers?

*The concept of "Willingness To financially Participate"
WTP*

- **9 countries involved**
- **10 448 lay people surveyed**
- **5 years of research**



- **Stratified sampling strategy:**
Gender, Age, Edu, Income, Occupation status, Region of residence

	N of people surveyed	Year of the survey	CERN MS
	1 000	2018	YES, host State
	1 005	2017	YES, host State
	1 084	2022	YES
	1 027	2022	YES
	1 053	2022	YES
	1 072	2022	YES
	1 094	2022	YES
	2 048	2022	NO (Observer)
	1 065	2022	NO (Observer)

Cash contribution to the 2021 CERN budget		
MCHF	% (tot budget)	CHF per capita (pop 18+)
45.97	4.0%	6.5 CHF
162.65	13.9%	2.9 CHF
122.47	10.5%	2.3 CHF
243.98	20.9%	3.3 CHF
173.74	14.9%	3.4 CHF
33.14	2.9%	1.0 CHF
22.39	1.9%	2.7 CHF
zero	/	/
zero	/	/

4-section questionnaire

YOUR INTERESTS

General interests and opinions about the importance of scientific research

A

YOUR KNOWLEDGE OF CERN

Focus on CERN and its research activity

B

YOUR SUPPORT TO CERN

Questions to elicit respondents' WTP for future investments in particle physics research

C

YOUR PROFILE

Respondents' demographics

D



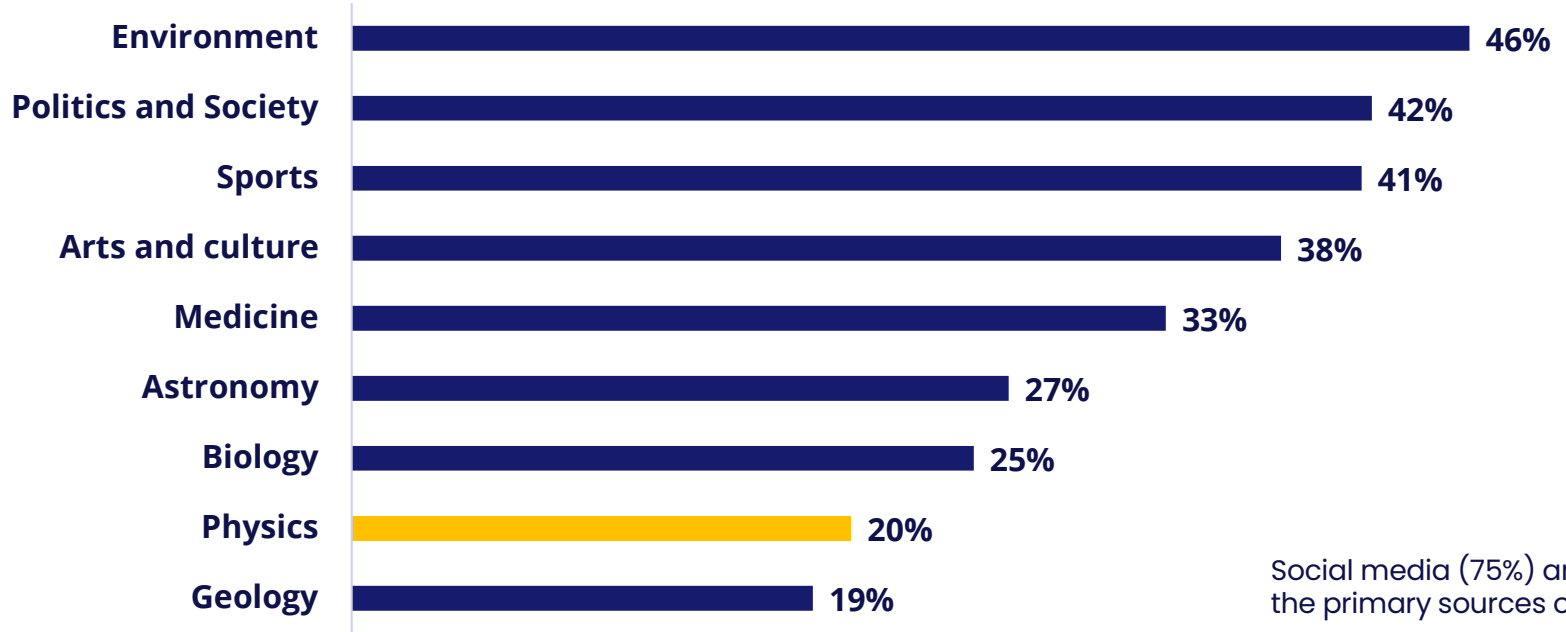
What is CERN?

- 2-page factsheet
- 2-mins video



Attitudes towards
scientific research

% of respondents interested in the listed topics



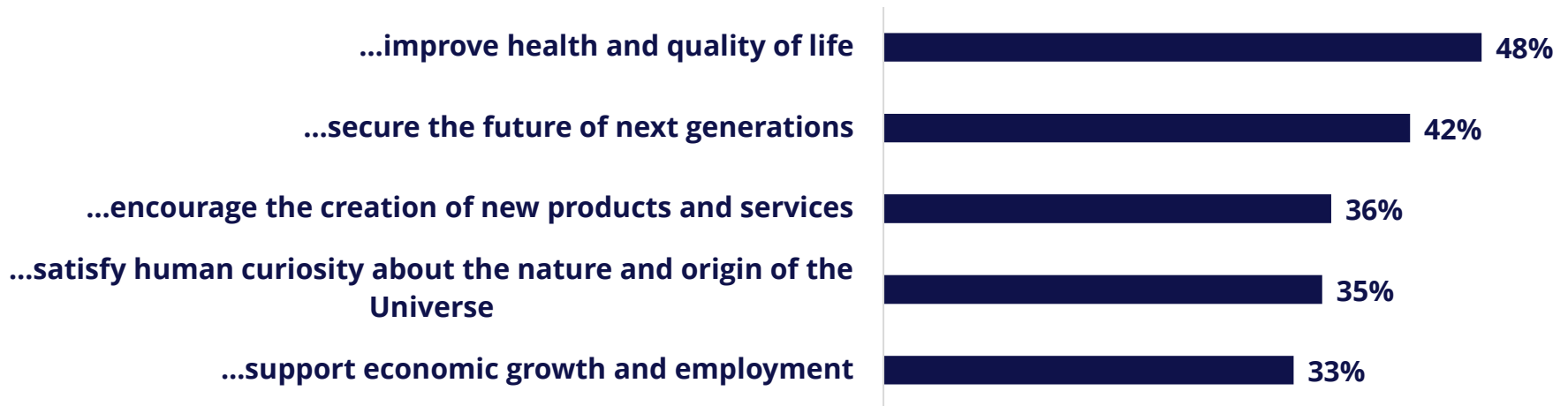
Social media (75%) and TV (66%) are the primary sources of information



Total N of respondents = 10 448

% of respondents who agree with the listed statements

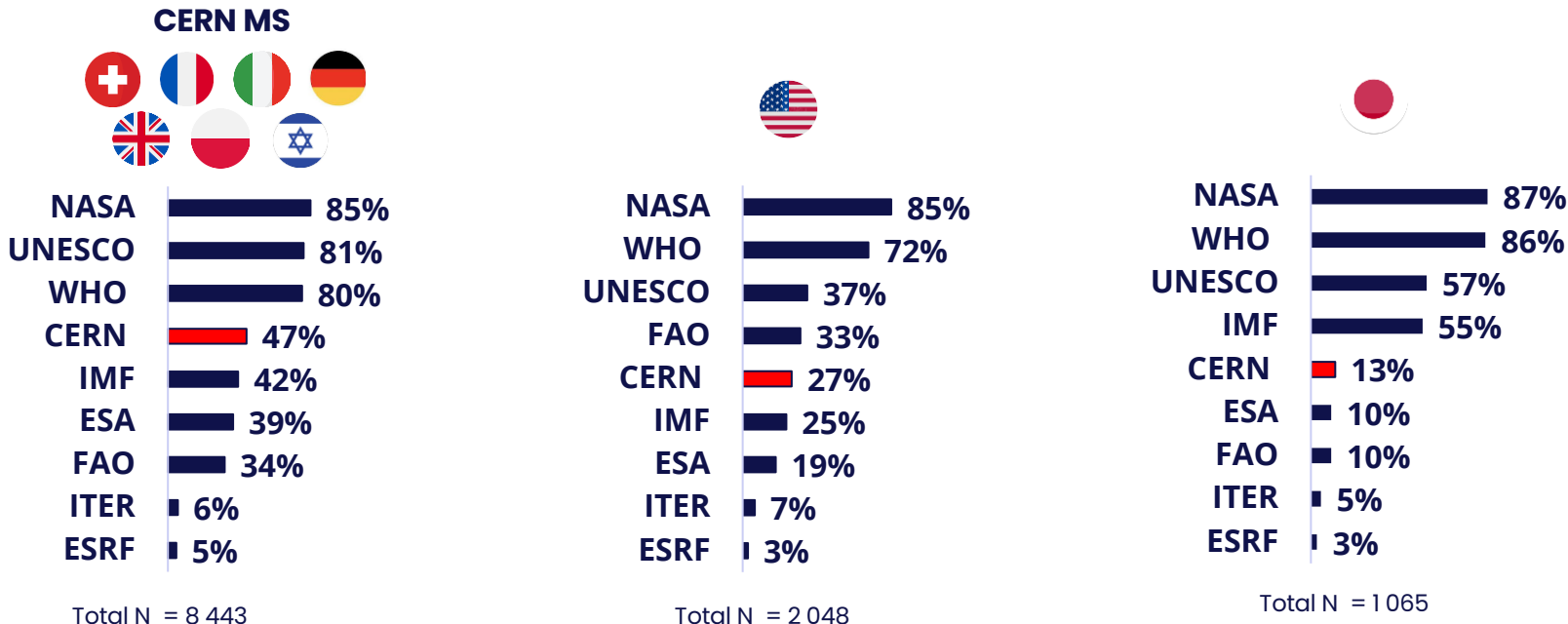
Scientific research is important to...



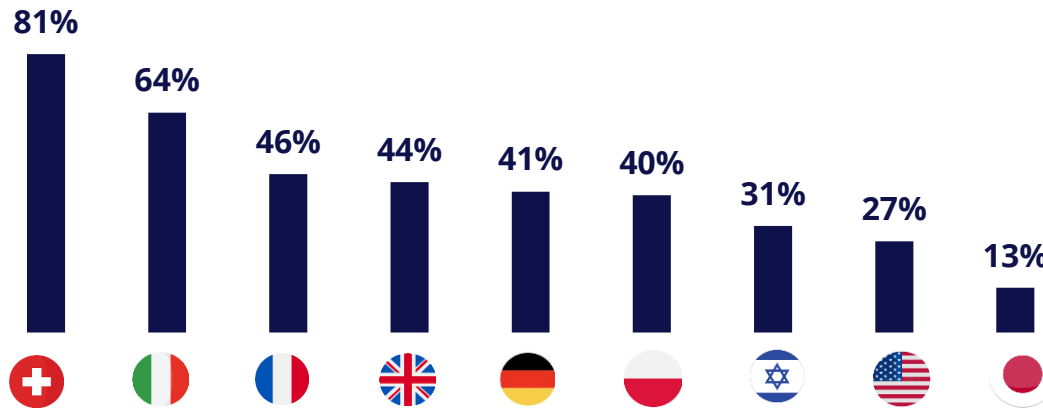


Awareness and
opinion of CERN

% of respondents who are aware of CERN vs other international organisations



% of respondents who are aware of CERN



Source of information

You know CERN because of...	CERN MS	USA	Japan
Media (TV, web, and social media)	32%	20%	9%
Reading books and specialised magazines	19%	9%	4%
Films and documentaries	14%	8%	2%
Word of mouth	13%	7%	2%
During my studies	11%	5%	2%
Visited CERN	2%	1%	0%
During my job	2%	2%	1%
Cultural Events	2%	1%	0%

Not aware of CERN

53%

73%

87%

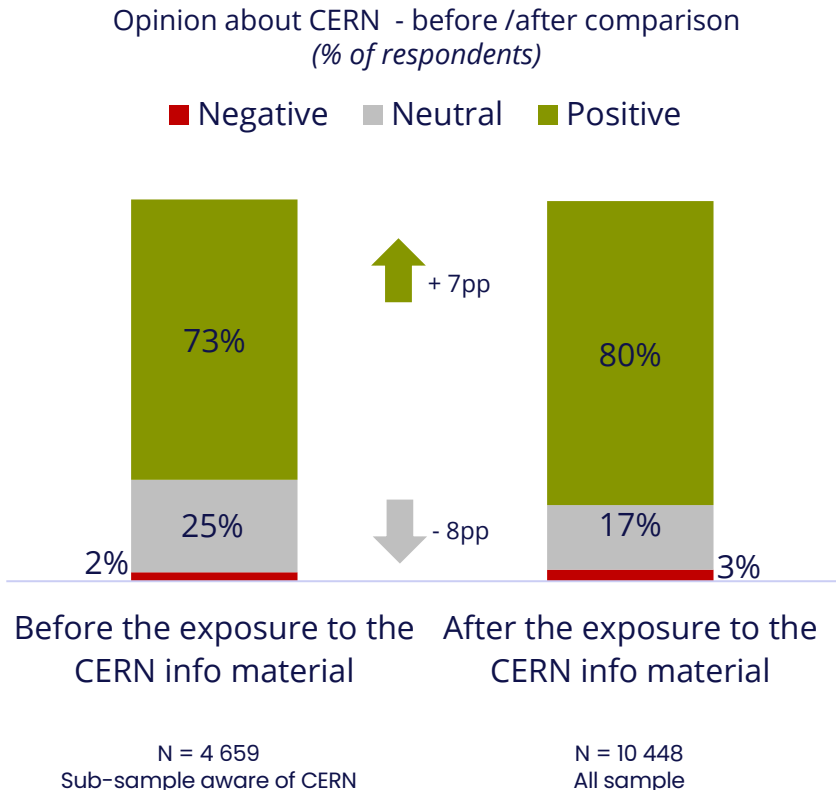
Total N of respondents aware of CERN

N = 3 968

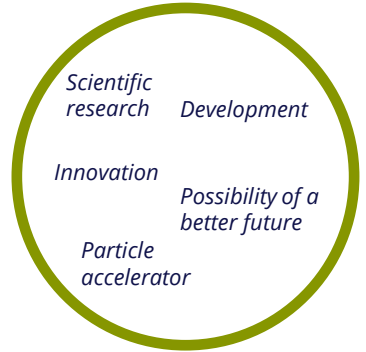
N = 553

N = 138

Communication increases knowledge and positive opinions while reducing neutral perceptions



Aspects of CERN that you like



Aspects of CERN that you do not like

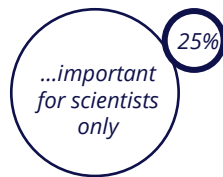


% of respondents who agree with the listed statements

Total N of respondents = 10 448



Scientific research at CERN is...





Willingness to financially
participate (WTP) in a new
particle accelerator

We asked for respondents' willingness to financially support the investment scenario A

INVESTMENT SCENARIO

*The FCC international collaboration **decides to invest in a new particle accelerator** in the next decade. **It will make discoveries on phenomena that cannot be explained today.** This new accelerator will be operated for at least twenty-five years.*



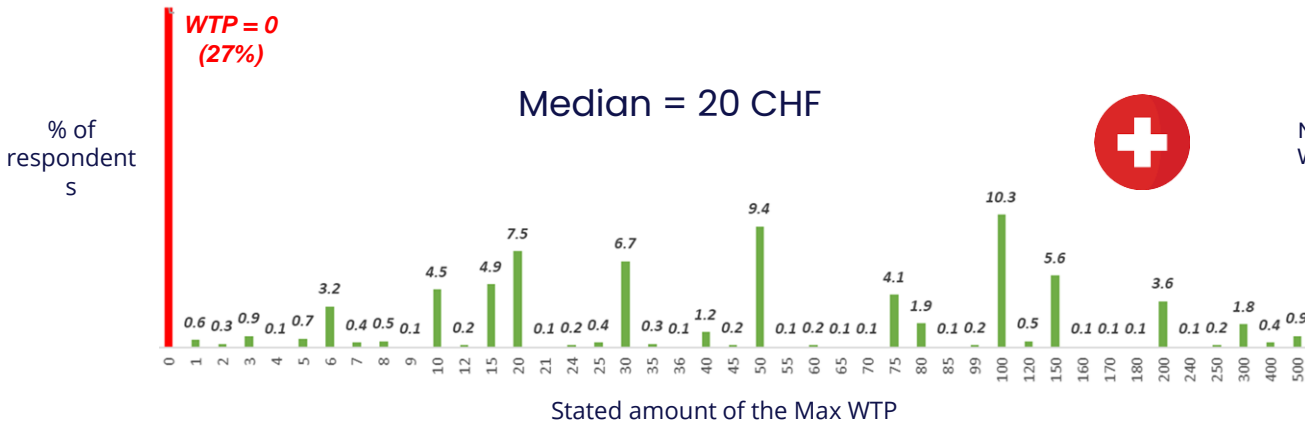
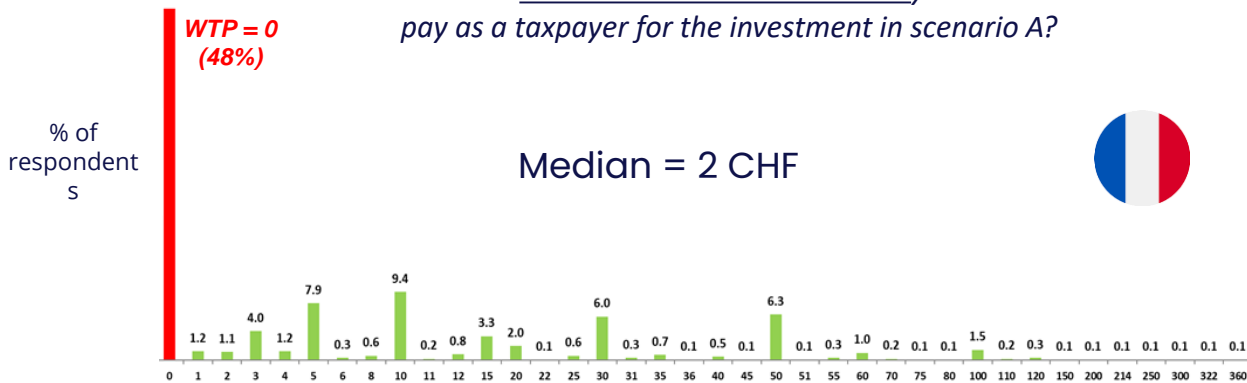
NON- INVESTMENT SCENARIO

*The FCC international collaboration **decides not to invest** in a new particle accelerator. The research activity with the existing accelerator, the LHC, will gradually decrease over the next twenty years. **The possibility of finding answers to unexplained phenomena will remain limited.***












Stated Max WTP in CHF (examples from FR and CH)



















What is the maximum annual amount you would pay as a taxpayer for the investment in scenario A?



Stated amount of the Max WTP

WTP results: the value of a scientific research programme based on a future circular collider perceived by respondents is higher than the actual tax amount transferred to CERN by the respective country

	Max WTP per person per year (all sample, incl. respondents with WTP = 0)	Max WTP per person per year (sub-sample of respondents with WTP > 0)	Cash contribution (tax) per person in 2021
	Median	Median	
Country	CHF	CHF	CHF
CERN member states			
	20	50	6.5
	2	11	2.9
	13	22	2.3
	11	22	3.3
	14	19	3.4
	6	10	1.0
	6	15	2.7
Non-member states			
	24	48	/
	0	18	/

Sub-sample of respondents with WTP > 0	Respondents aware of CERN
%	%
 73%	 81%
 52%	 52%
 76%	 65%
 69%	 39%
 77%	 46%
 77%	 38%
 68%	 28%
 73%	 27%
 29%	 13%

Main reasons for being willing to participate financially ($WTP > 0$)

% of respondents who selected the options

52%

Curiosity-related motivation

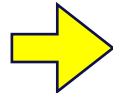


"I feel humanity has a duty to push the frontier of knowledge ahead"

"Always support CERN research even if no concrete/tangible application"

42%

CERN improves the skills and competencies of people



"Competencies/skills of all people involved in the projects will grow"

"CERN research advances knowledge in STEM subjects"

20%

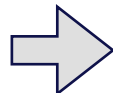
Industry-related impact



"Research enables companies to develop new products and services"

49%

Geographic-related impact



"Benefits for France and Switzerland (17%, 21%)"

"Benefits for Europe"

"Benefits for the entire world"

Main reasons for not wishing to participate financially (**WTP = 0**)

% of respondents who selected the options

37%

unaffordability

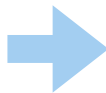


"Currently, I cannot afford this expense"

"I prefer to spend my money on other things"

26%

*Preferences to spend money for **alternative purposes or research***



"I think my taxes contribution should be used to fund other research activities"

"I think my money should be used to fund research in my own country"

25%

Not understanding the CERN research / **only stakeholders should participate**



"I do not understand the purpose of CERN's scientific research"

"Only people who directly benefit from CERN research should pay for it"

8%

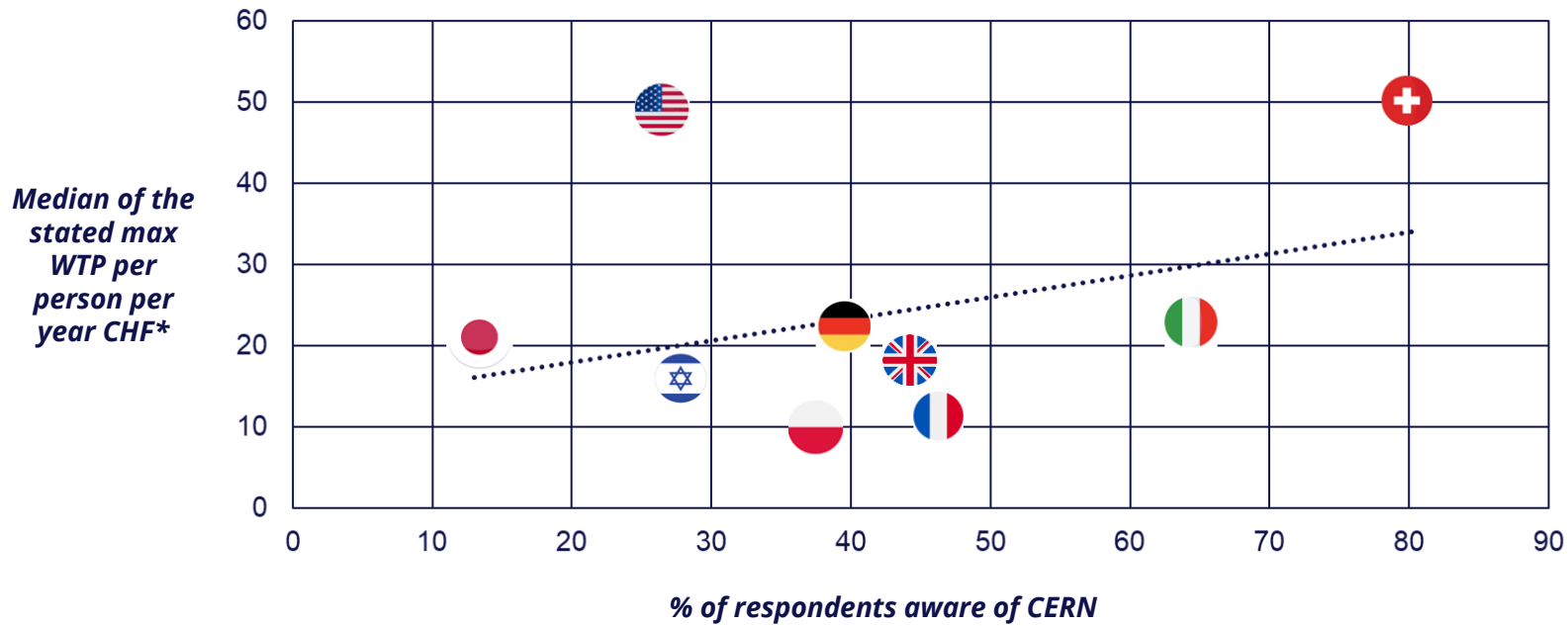
Protest



"I am against government-funded programs"

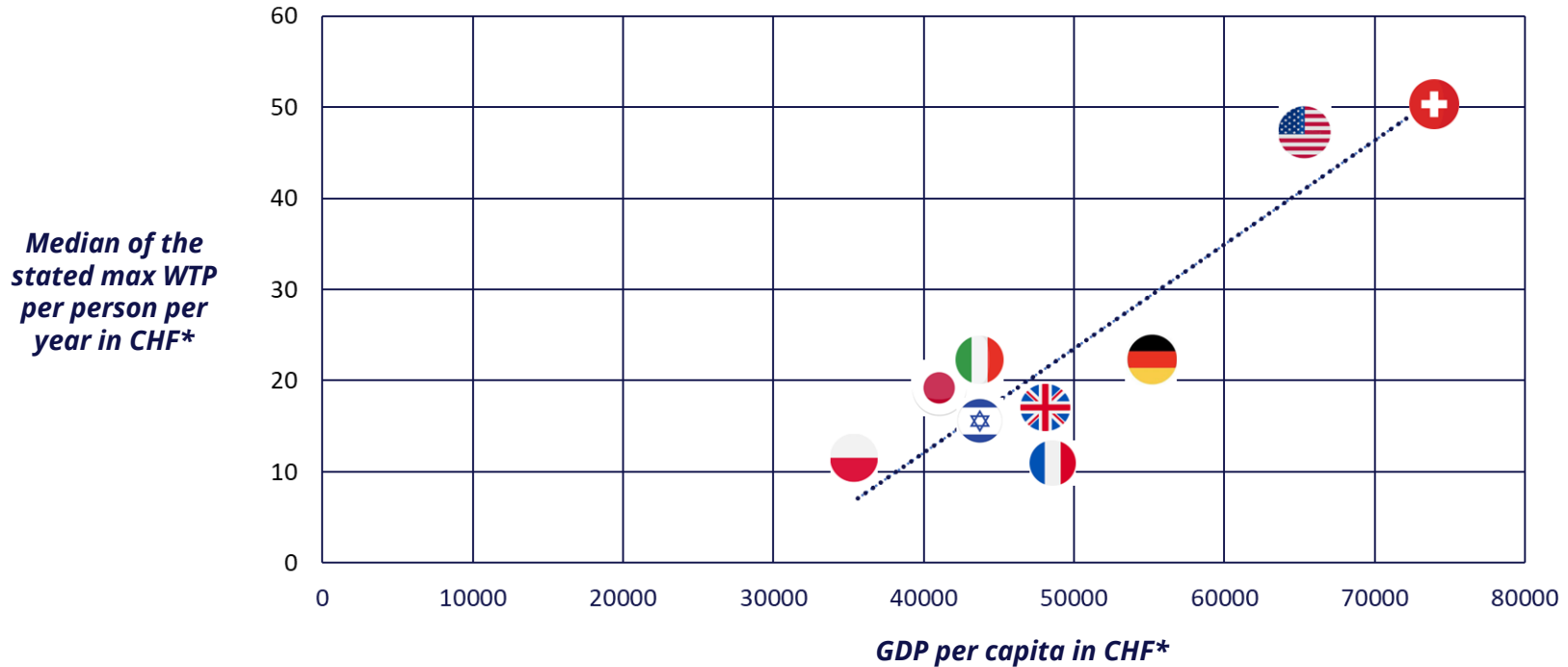
"I am against international organizations"

WTP is a positive function of the awareness of CERN



Correlation = 20%, (p -value < 0.01); * 2021 prices, sub-sample of respondents with WTP>0

WTP is a positive function of income



*Correlation = 85%, (p-value < 0.01), * purchasing power parity (PPP), 2021 prices*

Drivers of the WTP

$Prob(WTP > 0) = f(\text{socioeconomic traits, beliefs, opinions, bid asked})$



Income 

Bid asked 

Level of education 

Family size 

Being male 

Being employed (wrt unemployed, retired) 

Awareness of CERN 

Curiosity 

Having interests in science and research 

Main messages

1

Less than half of respondents (41%) knows what CERN and its mission are.

The awareness is far below that of several other international organisations such as NASA, WHO, UNESCO with variability from country to country.

2

Society is willing to give the opportunity to continue with discovery with a positive WTP.

The WTP varies by country and is driven by the socioeconomic characteristics of respondents in each country, including the level of awareness.

3

No discrepancies exist between the WTP and the contributions actually paid today and potentially being paid by future contributing states.

The value of a scientific research programme based on a Future Circular Collider perceived by respondents is higher than the actual tax amount transferred to CERN by the respective countries