

## Perceptions and attitudes regarding the vaccination debate in Europe: Empirical typologies and regional inequalities

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### **Abstract**

*Vaccination concerns and motivations regarding this topic are increasingly discussed not only among specialists but also by the general public. In this paper I rely on the Eurobarometer 91.2/ 2019 survey and I classify European respondents in four attitudinal profiles, from the skeptical ones to the pro-vaccination type. This survey conducted by the European Commission is the most recent study in the field with a European coverage which allow us to compare and view nationally and regionally this sensible topic. This empirical classification captures statistical variability and helps build a more nuanced profile of European countries, in order to adapt national policies of awareness to vaccination and the current health risks.*

### **Keywords**

*Vaccination; Survey research; Attitudinal clusters; K-means clusters;*

### **Introduction**

In light of recent events, vaccination continues to be a highly debated topic, whether it is brought into attention the new wave of Ebola in Africa (World Health Organization), the measles epidemic in New Zealand (NZ Ministry of Health) or research that has shown that malaria could be permanently eradicated in a single generation (BBC News). In recent

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years, the debate has become more and more widespread, with scientific data being diverted by anti-vaccination discourses or skepticism about immunization.

The whole debate generates a far-reaching social risk by amplifying skeptical discourses on vaccination on social networks and creating closed digital communities in these types of representations. In these networks and communities, trust in health authorities is low, and the idea of an international conspiracy between them and pharma companies is created and circulated. Misinformation, the lack of scientific accuracy and the superficiality of information received from the online environment have gradually led to the outline of a social risk for more and more individuals and for future generations.

Vaccination, use of antibiotics or smoking, consumption of processed food, as well as other health risks, have an individual characteristic defined by personal agency, created at the intersection of relevant discourses and resources available to the individual. In order to analyze the information held by the population, the European Commission conducted a European survey, the data contained in Eurobarometer 91.2 being collected from the territory of 28 Member States of the European Union, based on a stratified sampling, with 27,524 respondents aged 15 and over 15 years.

The recorded data show that, at European level, only 44.2% of the surveyed individuals have a vaccination card, a similar percentage, 41.7% responding that they do not have such a card – 14.0% of them are in possession of a card both for themselves and for the children. Regarding a recent immunization or in the last five years, 43.2% responded that they were vaccinated during this period, 34.2% did not do it, and 12.9% were vaccinated with the child / children. Surveyed about the reasons why they have not been vaccinated in these five years (multiple answer), 37.7% answered that they do not see the need in this approach, 28.2% are still under the protection of previous immunizations while to a percentage of 22.6 has not been offered a vaccine by medical staff (family doctor, pediatrician or other medical staff) (Table 10, annex). Of the 43.2% (11,889 individuals) who answered that they had been vaccinated in the last five years, asked for motivation (multiple answer), 58.1% were immunized following the recommendation of the family doctor (or other medical staff), 27.1% on the recommendation of public health authorities and 17.2% in need for a trip abroad.

Contrary to the authorities' view of a good European and national representation of the topic of immunization, 29.6% of respondents said they had not read, seen or heard anything about vaccination in the last six months – 54.6% saw on TV, 20.1% read in newspapers / magazines and 16.7% heard on the radio (multiple answer, figure 3, annex). Naming the number of deaths caused by infectious diseases, more than half of the respondents consider that, currently, influenza (59.5%) and meningitis (51.0%) are the cause of many such deaths, while measles, despite the constant presence in the public space, registers only 37.2%, even less than hepatitis (40.9%). Presented as preventable infectious diseases, most respondents are convinced of the effectiveness of preventive vaccination (51.2%), about 35.5% considering that immunization would probably be an optimal solution.

In this study I aim to understand the diversity of the reporting of the European population to skeptical discourses on vaccination, by studying individual opinions on vaccination.

## Methodological clarifications

I have built behavioral typologies based on attitudes and perception of Europeans through k-means cluster analysis (SPSS), for national and regional relevance by weighting the data for the representative sample at the level of the European Union (EU28).

For their generation, I have included only respondents that, for the question “If the previously mentioned diseases are infectious and vaccines can be efficient in their prevention?” answered “definitely” and “probably yes” – 23,386 individuals, the equivalent of 86.7% from the studied sample. In order to monitor the degree of intensity, the statements of agreement and disagreement were recoded, 1 representing *total disagreement* and 4 *total agreement*. The degree of knowledge of the subject was measured by breaking down into four true / false statements, the label of veracity being established by reporting to the scientific community that shows a majority position for vaccination – later, it was operationalized as the sum of the four statements with three levels of *knowledge* (low - medium - high). Similarly, I have recoded the variables regarding the respondent's age, education and country of origin, the Leibniz Institute working regionally on Eastern / Western Germany and Great Britain / Northern Ireland.

Structured in four different types, the final classification resulting from the k-means analysis is an exploratory and empirical one, statistically highlighting the similarities and differences between the respondents, without a clear theoretical premise. The data were initially processed on six and later five clusters, but the differences identified were not very well highlighted, showing the nuance rather than the true pursued purpose. I have sketched the socio-demographic profiles and studied the correlation of the resulting typologies with various statements on the researched topic, aiming to highlight regional inequalities and some trends depending on the socio-economic-political context of Europe, thus emphasizing geographical influences in the daily habits of individuals.

The research tool disseminated by the Leibniz Institute was created in accordance with public space debates focused on the topic of vaccination, highlighting two of the main elements in both the pro-vaccination and anti-immunization movement – the degree of knowledge of the subject and personal trust in sources of information. For the information sources, at first glance it was chosen to mention them and subsequently, in the indexing of reliable sources, the respondents being able to choose only one.

**Table 1. Main items in the pro- / anti-vaccination debate**

True or false	Sources of information	
Vaccines overload and weaken the immune system	Family	Pharmacists
Vaccines can cause the disease against which they protect	Friends	Online social networks
Vaccines can often produce serious side-effects	Your general practitioner, a doctor, or a paediatrician	Other Internet sites
Vaccines are rigorously tested before being authorised for use	Other health care workers (nurses, specialist doctors, etc)	The health authorities

Being an applied survey, there is a possibility that the respondents offered the answer that is considered to be expected by the operator to name sources of information – thus, there is highlighted a high degree of trust in doctors / medical staff (75.5%) and very low in family (3.5%), friends (1.3%), especially in social networks (1.1%) and the online environment (2.2%). To identify various European trends, regional inequalities and even the possible occurrence of national social risks, I have analyzed through statistical correlation the previously named items with socio-demographic variables (gender, age, education, residency environment).

### **Empirical typologies in the European debate on vaccination**

Contrary to the positive response regarding the vaccination efficiency of the analyzed target group, the k-means clustering results had identified an opinions continuum, including two polarized types (skeptics and those pro-vaccination) and two middle groups whose valences from a category to another varies according to the group to which they relate. It can be observed that the analysis did not identify a group of influencer-type opposers, defined by a vaccination resilience, formed as a result of intense information on the topic, on side effects, issues and risks that they are subject to when vaccinating. The views and attitudes on the basis of which the k-means analysis was run, generated a firm but informed support group and one in some form of disagreement but poorly informed. Despite the fact that certain aspects of the analysis are not well rendered or outlined by clustering, the correlation of the resulting typologies with a series of clear items on the subject, clearly define the position of Europeans in one of the current for and against groups of vaccination.

**Type 1 / Skeptics** – With a moderate percentage and only 2,268 respondents, this type describes those with an average degree of knowledge and information on the issue of vaccination, mostly in disagreement with the statements that define the usual vaccinations important for the whole society and the fact that its lack can lead to serious health problems (Table 2). Their approach is more clearly based on the statement that vaccination is important only for children, with more than three quarters of the 9.7% of Europeans in this cluster agreeing with this paradigm - not entirely, the figures placing, however, the group average beyond quartile 3. It should be noted that this category appears given that the entire analysis is carried out on those who recognize the importance of vaccines in disease prevention.

**Table 2. K-means cluster analysis: empirical positioning types on vaccination**

	Type 1 Skeptics	Type 2	Type 3	Type 4 Pro
Degree of knowledge of the benefits of vaccination	1.78	2.41	2.37	2.59
'It is important for everybody to have routine vaccinations'	2.26	3.74	3.09	3.89
'Vaccines are only important for children '	2.84	3.71	1.94	1.26
'Not getting vaccinated can lead to serious health issues'	2.32	3.69	2.94	3.84
'Vaccines are important to protect not only yourself but also others'	2.56	3.77	3.19	3.96
'Vaccination of other people is important to protect those that cannot be vaccinated'	2.60	3.77	3.12	3.92
% of cases in each cluster	<b>9.7%</b>	<b>15.0%</b>	<b>30.4%</b>	<b>45.0%</b>

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

An important aspect in characterization concerns personal information through the direct nomination of reliable sources - "The most reliable source of information". The recorded data shows that there is a greater online influence compared to other types but, even in these conditions, they value more the information received from the family doctor and other medical staff. This influence is marked by the nuances in the percentages that show how, compared to the other groups, the 2,268 Europeans included in this type, give a slightly higher confidence to social sites and platforms (5.5%) and slightly lower to the health staff (Table 6, annex). It should be noted the discrepancy in the authorities in the field and other official forums, in which the percentage of trust is almost half compared to the group 4, which supports vaccination (9.5% vs. 17.5%). Last but not least, when it comes to uninformed opinions, there is also the 6.5% trust given to family and 2.7% to friends, slightly increased numbers compared to the rest of the respondents, the general average placing those close to about 3 percent.

Their positioning against the necessity for immunization is once again validated by the answers per case that were offered to the questions regarding the opinion on vaccination results. In this case, there can be clearly observed a main thesis of the anti-vaccination movement, the perception of these respondents highlighting that vaccination weakens the immune system (66.7%), can cause the illness that they should to protect against (64.6%) and can often produce serious side effects (78.7%). For all these statements, the group is showing the largest percentages from the analysis at a comparative level, while the premise that the vaccines are rigorously tested before their authorization for administering, despite the fact that they follow the European trend, only 69.6% agree, the others surpassing the agreement and the confidence level at over 90.0%.

The category continues to be an interesting one also from a socio-demographic point of view (Table 3), being the only group composed of more men than women (51.0%) – mostly over 55 years old (40.9%), with a pre-university education (48.8%), coming from a

small-sized city / environment (39.9%). Without financial issues highlighted in the past year (60%), these respondents are somehow equally divided between the ones that have a permanent job (47.1%) and the ones that are not employed (45.1% – compound percentage, 27.6% retirees, 6.9% students, 6.8% unemployed, 3.9% housewifely) (Table 4).

**Table 3. Socio-demographic profiles of respondent types (column % per trait categories)**

		Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
<b>Gender</b>	Masculin	51.0	47.1	49.3	46.1	47.7
	Feminine	49.0	52.9	50.7	53.9	52.3
<b>Age categories</b>	15 - 24 years	10.8	13.1	13.0	13.9	13.2
	25 - 39 years	23.6	23.7	23.7	23.4	23.5
	40 - 54 years	24.7	25.3	23.6	24.3	24.3
	55 years and older	40.9	37.9	39.7	38.3	38.9
<b>Age at school completion - categories</b>	Up to 15 years	14.5	13.6	13.5	9.9	12.0
	16 - 19 years	48.8	45.8	44.4	36.2	41.3
	20 years and older	28.9	31.0	32.4	42.7	36.5
	Still studying	7.0	9.1	9.0	10.7	9.6
	No full-time education	0.8	0.4	0.7	0.6	0.6
<b>Type of community</b>	Rural area or village	34.0	31.3	36.0	32.1	33.3
	Small or middle sized town	39.9	37.8	36.7	39.0	38.2
	Large town	26.0	30.9	27.3	28.9	28.4

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

**Type 2** – With a moderate knowledge and an informed opinion, the Europeans from this group, with slightly lower scores compared to Type 4 / Pro-vaccination, agree with the importance of vaccination at a society level, acknowledging the necessity of this approach. The statement that separated them from the rest of the Europeans studied in the analysis, including them into a unique category is the fact that they score the highest, nearly a universal agreement, regarding the fact that vaccines are important only for children. It must be noticed that despite an informed pro-vaccination opinion, the group scores a low percentage – 15.0%, the equivalent of 3,502 respondents.

60.2% of those in this category do not agree that vaccines overload or weaken the immune system, similar to the 56.6% who say it is false that they can cause the disease against which they are supposed to protect. The direction of the group changes with regard to the statement that vaccines can often cause serious side effects, with 56.5% agreeing with the risk to individuals at the time of vaccination, contrary to the 92.0% given to their trust and the premise that they are rigorously tested prior to authorization and dissemination on the market.

Like Type 3, the trust given to the family as a source in the field of vaccination is half that of the skeptics / Type 1 and double that of the pro / Type 4 – 3.4%. A slight influence of online can be identified in this case, as they admit in a proportion of 3.4% that they trust what they read online, but the main source is the authorized staff (87.0% - clearly follows type 4 with 94.0%). A group made up of mostly women (52.9%), with pre-university education (45.8%), living in a small and medium-sized city (37.8% – small differences between rural and large urban areas), without a current job (47.2% – compound percentage, 27.3% retirees, 9.0% students, 5.7% unemployed and 5.2% housewifely) and mainly from the middle class of society.

**Type 3** – a large group of 30.4% of respondents, this group includes those with a moderate knowledge of the subject and who mostly agree with the statements about the importance of the vaccine in society. The only disagreement is with the idea that vaccination is only for children. These Europeans describe an informed opinion which, despite strong opinions from both supporters and pro-vaccination opponents, have managed to delimit themselves, recognizing the importance of the vaccine in contemporary society.

Table 5. Positioning true (T) / false (F) in topic - in-cluster distribution (% per column)

		Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
Vaccines overload and weaken the immune system	T	66.7	39.8	38.9	22.1	33.4
	F	33.3	60.2	61.1	77.9	66.6
Vaccines can cause the disease against which they protect	T	64.6	43.4	43.2	35.8	41.6
	F	35.4	56.6	56.8	64.2	58.4
Vaccines can often produce serious side-effects	T	78.8	56.5	57.8	41.3	51.8
	F	21.2	43.5	42.2	58.7	48.2
Vaccines are rigorously tested before being authorised for use	T	69.6	92.0	91.7	96.0	92.1
	F	30.4	8.0	8.3	4.0	7.9

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

In terms of sources of information and the trust placed in them, group 3 is positioned next to the skeptics / Type 2 when it comes to family / friends (4.4%) and the online environment (2.8%) and next to supporters / Type 4 then when the specialized institutions are nominated (89.2%, compound percentage). Opinions are divided when it comes explicitly to the case of immunization, with the majority agreeing that vaccines do not weaken the immune system (61.1%) and do not cause the disease in question (56.8%). Following the trend of the other groups, even though over 90% say they are aware that these vaccines are rigorously tested before they are authorized, 57.8% of the 6,278 respondents in the cluster are convinced that these immunizations can often cause serious large-scale side effects.

Similar to the group of skeptics / Type 1, this one is also balanced in terms of gender (difference of 100 respondents, equivalent to 1.4%) but also of the environment, a similar

percentage being recorded in rural and urban areas with small- / medium-sized cities (36.0% and 36.7%, respectively), as well as professional status (46.5% without a current job and 46.1% employed at the time of data collection).

**Type 4 / Pro-vaccination** – On the other hand and the majority at European level, are those with whom they strongly agree on the importance of vaccination at the societal level and its regularity, considering it necessary for all people and not just children. The opinion of this group is supported by a sometimes-high degree of information – like skeptics in Type 1, they too make a series of statements based on a documented knowledge of the topic. The degree of knowledge and information on the topic is completed by the percentages recorded on the series of statements highlighting the risks / benefits of vaccination – they do not agree with the idea that vaccination weakens the immune system (77.9%) or can cause the disease against which it is supposed to provide protection (64.2%). The group's thesis, their position on the topic, is complemented by 96.0% agreement on rigorous testing of vaccines before mass distribution on the market, as well as disagreement that they can cause serious large-scale side effects (58.7% – only group that positions itself in this way, the rest considering that this risk exists).

Regarding trust in information sources, respondents in this category give a high percentage to medical staff and accredited institutions in the field (94.0%), while information from family or social networks is placed under the auspices of distrust, compared to lower values (1.7% and 0.5%, respectively). Whether they are described as idealists, they consider that the authorized individuals, who work and possess knowledge in the field are also those from whom society should take its information, not from those close or unknown who pass the data through the personal filter of subjectivity.

Mostly women (53.9%) with a university education (42.7% and 10.7% still enrolled in studies), a permanent job (47.5%) and residence in a small- / medium-sized city (39.0%). Without clear financial difficulties registered in the last year (75.8%), the respondents included in this typology have, comparatively, a higher presence in the upper part of the middle class (11.0%) and lower in the lower and working class (37.1%), the difference rising to nine percent.

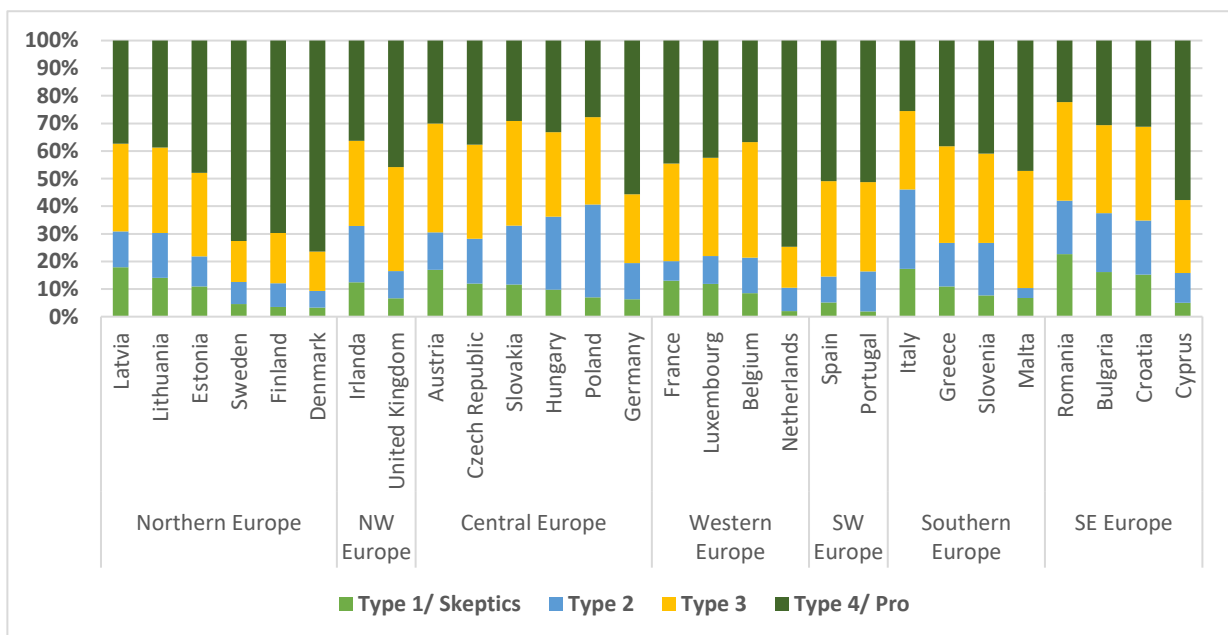
### **Regional inequalities**

The four previously established and socio-demographically described types can be analyzed from a regional and implicitly national perspective, the graph in Figure 1 showing the distribution of each cluster in the 28 states, increasing according to Type 1 / Skeptics. Once again, the influence of social development can be seen more prominently in the Nordic and Western countries, in Denmark 76.4% of respondents in the analysis positioning themselves on the side of those who support vaccination, as well as the Netherlands (74.6%), Sweden (72.6%) and Finland (69.7%). At the opposite side, the Eastern influence can be identified with predilection in the sorting centered on skepticism (Type 1), Romania (22.6%) registering the highest value, followed by Latvia (17.9%), Bulgaria (16.2%) and Croatia (15.2%). A classification according to Type 2, those with moderate knowledge, agreeing with the importance of vaccination but aimed especially at children, reveals a central European



trend – Poland (33.7%), Hungary (26.4%), Slovakia (21.4%), while for Type 3, the Western and Central countries are highlighted – Belgium (41.8%), Austria (39.4%), Slovakia (37.9%).

At European level (N = 27,524), the four statements regarding the true / false individual positioning in relation to the topic of vaccination correlate statistically with the socio-demographic variables on education and the environment of residence. Among them, age and gender are revealed to be a significant causality only for certain cases. The results show how those who hypothesize that vaccines weaken and overload the immune system agree that they can cause serious side effects such as the disease intended for immunization, considering false rigorous testing before mass distribution. Those who agree that vaccines can cause serious side effects are rural women, less educated than men whose main source of information is friends and social networks, while individuals who agree with the weakening of the immune system come from rural areas and have a moderate education, taking the necessary information from family, friends and online (p = 0%). Adult and elderly Europeans are the ones who are of the opinion that they can contact the disease meant to be cured by vaccination, people with a moderate rural education on whom the influence of friends and social media is identified. Contrary to this trend, those who agree with the statement of rigorous testing of vaccines before distribution are educated people in rural areas (p = 3.4%) who are strictly informed by doctors, specialized medical staff, pharmacists and the forums of the authorities in public health.



**Figure 1 - Country-level distribution across attitudinal profiles (EU 28, regional arrangement by Type 1 / Skeptics)**

Linking directly the sources of information at European level, it can be noticed that those who trust in the sayings of their families are doing the same with friends and information found on social media, with the observation that those who go directly to

social media nominate other online websites too<sup>2</sup>. The second category of respondents includes those who follow information received from medical staff, while there is a malleability among those who directly nominate doctors, on the other hand reaching out with the same degree of trust to pharmacists and public health authorities – compared to those who choose information received from the family doctor and who also reach out only to other staff from the area (specialty doctors, nurses).

Socio-demographically, the analysis run at a European level (EU28) shows that, from a gender discrepancy perspective, women are less educated and older than men – informing themselves trustfully from the family doctor and other authorized medical staff, they believe that vaccines can cause serious side effects. From an environment of residence point of view, those located in rural areas are gaining information strictly from doctors, compared to those who live in urban areas, who prefer to take their information from a wide range of sources (family, friends, social networks, online sites, Health authorities, medical staff). The influence of the online environment is also identified in Europeans with higher education who know the issue of vaccination and trust the information received from medical staff and authorities in the field. Compared to the European trend, in Romania there was a lower significance between the correlated items. From the perspective of age, adults with a low education and coming from rural areas are those who turn to the family doctor – in comparison, young people with higher education in urban areas are strictly informed by the family doctor, health institutions, but also from the online environment (social networks and other websites). At a national level, the assimilation of information from reliable sources identifies two groups: one in which the main influence comes from family and friends, and the second, the group of those who choose to go to the doctors, also listening to medical staff and institutions in public health sector.

## Conclusions

The study in this chapter manages to present the perception of Europeans in the issue of vaccination, using the data contained in Eurobarometer 91.2 / 2019 – research with an instrument applied by the Leibniz Institute to 27,524 respondents aged 15 and over, in 28 European Union Member States. Starting from the individuals who consider that vaccination is effective in preventing infectious diseases, based on the opinions and attitudes expressed, we managed to establish a pragmatic typology, the final classification grouping the respondents into four types. (1) Skeptics that disagree with the statements that define the usual vaccinations important for society as a whole and the fact that the lack of proper immunization can lead to serious health problems, considering vaccination important only for children. Although they recognize the effectiveness of vaccination and agree to some extent with testing products before distribution to the population (Table 5), they are skeptical of the main thesis of those identified as antivaxxers, taking into account the effects and risks of which an individual undergoes at the time of immunization. Those

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<sup>2</sup> There is no clear specification from the Leibniz Institute regarding what has been included in the *online websites* category, thus it can be said that it comprises both personal blogs and official websites of institutions, media trusts and other forums affiliated to the Ministry of Health.

who were initially excluded from the k-means analysis, namely individuals who do not agree with the effectiveness of vaccines in the prevention of infectious diseases, show a similar tendency to skepticism, about 65.0% agreeing with the risk of weakening the body by immunization and the possibility of counteracted disease and 74.1% with the risk of developing serious side effects. Of this group, 54.9% of individuals have not been vaccinated in the last five years, 18.4% doing so and 21.3% immunizing their children. Respondents of the types (2) and (3) make the transition to group (4), which supports vaccination regardless of context. These individuals are convinced of the rigor of vaccine testing (96.0%) and that they do not weaken / overload the immune system, even if below average, some of them recognize to some extent the possibility of side effects (41.3%). Of the 10,514 individuals included in this type, 60.0% have been vaccinated in the last five years and 32.6% have immunized their children, out of the percentage of 19.7% who did not, 44.0% being still under the protection of previous vaccines (Tables 7 and 8).

Socio-demographically, the final classification established for each type a profile focused on gender, age, education, environment of residence, as well as socio-professional status, possible economic problems encountered, social class and even their own degree of satisfaction with life. A series of statistical analyzes were processed at European level (EU28) in comparison with the general trend identified in Romania, revealing that those who declare at European level (EU28) agree with the need and safety of vaccination are young people with higher education who belong to the urban environment and trustfully take information from a diverse range of sources (family doctor, accredited medical staff, pharmacists, online sites and public health authorities). Comparatively, at national level (Romania), the same socio-demographic group prefers to be informed mostly by the authorized medical staff.

The appearance in the k-means analysis of a skeptical type despite the agreement with the effectiveness of vaccination in the prevention of infectious diseases, demonstrates how, contrary to public opinion and the image created by the press of this group, antivaxxers are not people who completely reject vaccines. The main thesis of their speech highlights that in some cases, immunization is useful but has very high risks for some, hidden risks that often force parents to choose whether or not to immunize their children. This difference must be clearly drawn between those who choose not to be vaccinated (themselves or someone close to them) and those who do not do so unknowingly (lack of education or information from medical staff).

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## Appendix

Tabel 4. Socio-demographic profiles of respondent types (column % per trait categories) (2)

		Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
Respondents' occupation	Self-employed	7.8	6.9	7.4	6.8	7.1
	Employed	47.1	45.9	46.1	47.5	46.8
	Unemployed	45.1	47.2	46.5	45.7	46.1
Social class	The working class of society	28.7	28.8	28.2	22.8	25.9
	The lower class of society	17.7	16.7	16.9	14.3	15.8
	The middle class of society	48.3	47.9	48.8	50.9	49.6
	The upper middle class of society	4.9	5.7	5.6	11.0	8.0
	The higher class of society	0.4	0.8	0.4	0.9	0.7
Life satisfaction	Very satisfied	20.1	24.6	21.7	35.7	28.3
	Fairly satisfied	56.3	57.7	61.7	52.5	56.5
	Not very satisfied	18.3	13.9	13.8	9.5	12.3
	Not at all satisfied	5.4	3.8	2.8	2.3	3.0

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

Tabel 6. Reliable information sources (column % per trait categories)

	Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
Family	6.5	3.4	3.4	1.7	2.9
Friends	2.7	1.3	1.0	0.4	1.0
Your general practitioner, a doctor, or a paediatrician	59.5	63.4	68.4	68.2	66.7
Other health care workers (nurses, specialist doctors, etc)	11.5	12.0	10.5	8.3	9.8
Pharmacists	4.8	4.8	3.5	2.1	3.2
Online social networks	1.9	1.2	0.8	0.5	0.8
Other Internet sites	3.6	2.2	2.0	1.2	1.8
The health authorities	9.5	11.6	10.3	17.5	13.7

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

Tabel 7. Respondents' motivation not vaccinated in the last five years (column % per trait categories)

		Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
"Have you or has someone in your family had any vaccinations in the last five years?"	Respondent	18.4	41.3	41.1	60.0	47.4
	Children	21.3	29.9	24.6	32.6	28.7
	Nobody	54.9	34.0	35.4	19.7	30.0

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

Tabel 8. Respondents' motivation not vaccinated in the last five years (column % per trait categories)

"Why have you not had any vaccination in the last five years?"	Type 1 Skeptics	Type 2	Type 3	Type 4 Pro	Total
You are still covered by vaccines you received earlier	17.0	27.9	28.5	44.0	32.0
You do not see the need to be vaccinated	45.1	33.8	39.2	33.8	37.4
You think that vaccines are not safe and they can have side-effects	17.3	5.3	7.2	2.9	7.0
Vaccines are only necessary for children	15.0	21.4	8.2	3.2	9.7
You have not been offered any vaccine by your general practitioner, a doctor, or a paediatrician	19.1	22.1	26.9	26.4	24.7
It is expensive	7.6	7.5	4.9	4.4	5.6
It is complicated and requires a lot of effort	4.2	2.9	2.3	1.7	2.5
Other reason	4.9	4.5	4.1	5.0	4.6

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386

Tabel 10. Respondents' motivation not vaccinated in the last five years (EU28)

"Why have you not had any vaccination in the last five years?"	Total	Gender	
		Men	Women
You are still covered by vaccines you received earlier	28.2	48.8	51.2
You do not see the need to be vaccinated	37.7	49.5	50.5
You think that vaccines are not safe and they can have side-effects	10.0	46.7	53.3
Vaccines are only necessary for children	10.4	47.6	52.4
You have not been offered any vaccine by your general practitioner, a doctor, or a paediatrician	22.6	47.8	52.2
It is expensive	6.0	47.2	52.8
It is complicated and requires a lot of effort	3.0	54.7	45.3

Source: Eurobarometer 91.2/ 2019, authors' analysis. N (valid) = 23386