

# MMR Vaccine Representation in New Media, in Romania\*

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## **Abstract**

*In the last decade, Romania was confronted with three measles epidemics, the last of which started in 2016. In the context of vaccination dropout and MMR (Measles, Mumps, Rubella) vaccine being the most rejected vaccine by parents among all, this paper carries out a primary analysis of the way the MMR vaccine is presented in the online media. The materials were selected according to the Google algorithm relevance criteria and resulted a corpus of 51 articles, presented on the first five pages of Google, in January 2019. The materials were analyzed from the point of view of the type of publication, the author, the date of publication and the approach of the subject, focusing on the articles presented on the first page.*

*The conclusion was that readers seek complete information and read articles that offer detailed information and prospects. The articles talking about side effects cover an important percentage too. Most articles have a second layer of comments, where the subject is debated between the readers. These interactions offer another scale of the debate and one can identify the most frequent messages and the tone of voice of both parties, pro and anti-vaccination.*

*The corpus of articles and conclusions will constitute the premises of a broader analysis that will include the Social Media interactions revealed by the comments on some articles, forums and Facebook posts.*

**Keywords:** *MMR vaccine, measles, epidemics, Romania, New Media.*

## *Introduction*

Romania faces the third epidemic of measles in the last decade which is also the most severe among all, with a total number of 15,671 cases registered from its debut

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in March 2016 until the moment of this research, January 2019.<sup>1</sup> The total number of deaths has reached 59, mostly children under one year old, not eligible for vaccination yet.

The Romania's situation is not unique in Europe. Last year's World Health Organization data have indicated countries like Ukraine, Serbia, Russia or France having higher cases of measles. Worldwide, the anti-vax campaigns are placed among the first ten world health threats for 2019, in a statement released by the same organization at the beginning of the year.<sup>2</sup>

The main cause for the measles epidemics is the dropout of MMR vaccination.<sup>3</sup> In order to obtain "the herd immunity"<sup>4</sup> that can offer a good protection for all categories of population: pregnant women, newborns, ill people, the 95% percentage of vaccinated people must be maintained. But in the last years, this percentage has decreased due to different factors and even countries where measles, mumps and rubella were eradicated, signals new cases nowadays.<sup>5</sup>

Studies try to establish a correlation between different aspects and reasons for the decrease of the vaccination percentage in different countries, even those with high level of education and income. Among the general conclusions of these studies is that the vaccination dropout can be caused by: the mistrust in officials, the healthcare system and politicians, the lack of vaccine stocks, the fear of side effects, the influence of the media who focus on the side effects of the vaccines, the right of free will and individual choice.<sup>6</sup>

A different kind of situation is met where 95% of the vaccination coverage was reached and measles epidemics outbreaks still appear. In these cases, studies have shown that the high percentage of vaccination is not enough - its homogeneity is also

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<sup>1</sup> Centrul National de Supraveghere si Control al Bolilor Transmisibile, *Situația rujeolei în România la data de 18.01.2019*, <https://cnscbt.ro/index.php/informari-saptamanale/rujeola-1/1058-situatia-rujeolei-in-romania-la-data-de-18-01-2019/file>.

<sup>2</sup> Ashley Welch, "Anti-vax movement among top 10 global health threats for 2019, World Health Organization says," *The CBS News*, January 17, 2019, [www.cbsnews.com](http://www.cbsnews.com).

<sup>3</sup> Edward Mills et al., "Systematic review of qualitative studies exploring parental beliefs and attitudes toward childhood vaccination identifies common barriers to vaccination," *Journal of Clinical Epidemiology* 58(11) (2005), 1081-8.

<sup>4</sup> Zoë C. Skea et al., "«Avoiding harm to others» considerations in relation to parental MMR vaccination discussions - an analysis of an online chat forum," *Social Science and Medicine* 67(9) (2008), 1382-90.

<sup>5</sup> David E. Sugerman et al., "Measles Outbreak in a Highly Vaccinated Population, San Diego, 2008: Role of the Intentionally Undervaccinated," *Pediatrics* 125 (2010), 747-755.

<sup>6</sup> Maggie Evans et al., "Parents' perspectives on the MMR immunization: a focus group study," *British Journal of General Practice* 51 (2001), 904-10.

important. Also, in these conditions, the 95% is reevaluated and considered maybe too low.<sup>7</sup>

In Romania there are some journalistic investigations trying to establish a connection between the decreasing number of vaccinated people and different factors. An analysis of the impact of the media on the decision of vaccination has not been done yet.

This paper is an overview of the materials one can find in the New Media, upon a mere Google search, taking into consideration the criteria of the search engine relevance. The analysis reveals the type of content parents are most interested in and the online portals that are accessed the most, in their need for information. Also, the recurring theme of side effects, mostly autism, shows that this is the biggest scare the MMR vaccine is associated with, since the publication of Andrew Wakefield’s study in 1998, in The Lancet. Although, the scientific conformity of the study was denied, the question and the doubt remain and influence people’s decision to vaccinate.

### Background

Last year, in August 2018, according to the World Health Organization (WHO) reports, the countries with registered measles epidemics were Ukraine (more than half of the total number registered in Europe, in the first half of 2018), France, Georgia, Greece, Italy and Serbia.<sup>8</sup>

2018														
Region	Member State	ISO country code	Total suspected measles cases	Number of measles cases by confirmation method				12 months rolling measles incidence per 1'000'000 total population	Number of rubella cases by confirmation method				12 months rolling rubella incidence per 1'000'000 total population	12 months rolling discarded measles/ rubella cases per 100'000 total population
				Total confirmed measles cases	Lab confirmed	EPI link	Clinically confirmed		Total confirmed rubella cases	Lab confirmed	EPI link	Clinically confirmed		
EURO	Albania	ALB	2595	1385	1290	0	95	477.05	0	0	0	0	0	
EURO	Georgia	GEO	1875	1397	1091	74	232	374.74	0	0	0	0	0.25	13.04
EURO	Russian Federation	RUS	4185	1822	1753	57	12	16.16	3	3	0	0	0.03	1.77
EURO	Greece	GRC	2257	2190	1231	482	467	271.11	0	0	0	0	0	
EURO	Italy	ITA	2499	2293	1773	136	384	43.73	19	6	3	10	0.42	0.38
EURO	France	FRA	2682	2682	1292	545	845	42.81	0	0	0	0	0	
EURO	Ukraine	UKR	31513	31312	5400	0	25912	770.01	201	12	0	189	4.52	
EURO	Serbia	SRB	5034	5034	2618	0	2416	649.09	0	0	0	0	0	
EURO	United Kingdom of Great Britain and Northern Ireland	GBR	888	886	886	0	0	15.49	2	2	0	0	0.06	0
EURO	Romania	ROU	895	889	721	149	19	92.07	6	4	0	2	0.35	0

Table 1. The number of confirmed cases of measles, in 2018, according to WHO (World Health Organization)

Even though, Romania was overpassed by other countries in reported measles cases, it is held responsible for spreading the epidemics in 2017.

In a special report issued by the European Centre for Disease Prevention and Control in 2017 and called “Ongoing Outbreak of Measles in Romania, Risk of

<sup>7</sup> Marcel Salathé and Sebastian Bonhoeffer, “The effect of opinion clustering on disease outbreaks,” *J R Soc Interface* 5 (2008), 1505-1508.

<sup>8</sup> World Health Organization, *Measles and Rubella Surveillance Data*, [https://www.who.int/immunization/monitoring\\_surveillance/burden/vpd/surveillance\\_type/active/measles\\_monthlydata/en/](https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/).

Spread and Epidemiological Situation in EU/EEA Countries”, Romania was indicated as one of the main sources for the measles epidemics outburst in several countries in Europe and the people visiting our country are warned to have their vaccines done before coming here.<sup>9</sup>

The infographic below shows the measles cases distribution in Europe correlated with the vaccination level where Romania is presented as a center of spreading the epidemics, when the report was issued, at the beginning of March 2017.

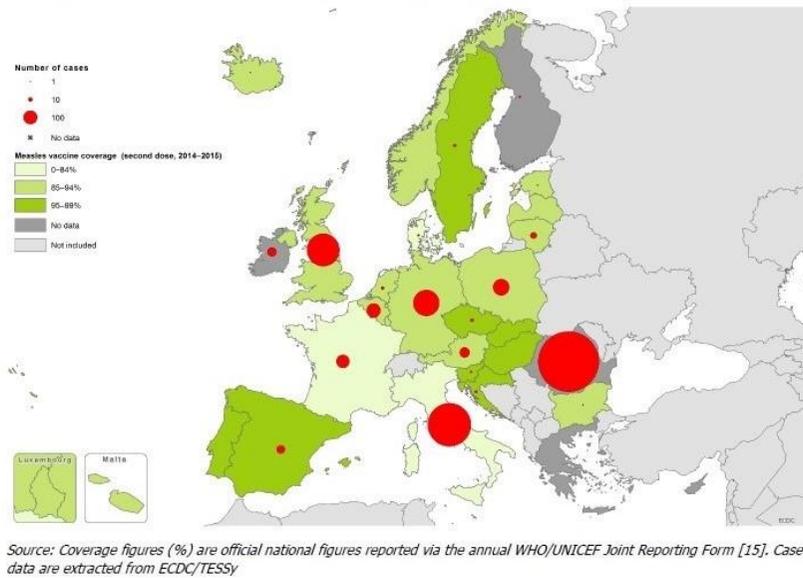


Figure 1. Number of measles cases between 1 February 2016 and 31 January 2017, and vaccination coverage with the second dose of MMR (2014-2015, WHO), EU/EEA countries<sup>10</sup>

The MMR immunization was introduced in Romania in 1979. Until that moment, the measles occurrence in our country was very high (approximately 120%<sub>000</sub>), according to the data registered by the National Centre of Spreadable Diseases Surveillance and Control.<sup>11</sup>

The mass vaccination campaigns and the introduction of the MMR vaccine in the National Vaccination Program have led to a significant decrease in the number of people infected with measles, mumps, and rubella, as can be seen in these CNSCBT statistics:

<sup>9</sup> European Centre for Disease Prevention and Control, *Ongoing outbreak of measles in Romania, risk of spread and epidemiological situation in EU/EEA countries* (Stockholm. ECDC, 3 March 2017).

<sup>10</sup> *Ibidem*.

<sup>11</sup> Institutul Național de Sănătate Publică România, <https://cnscbt.ro/>.

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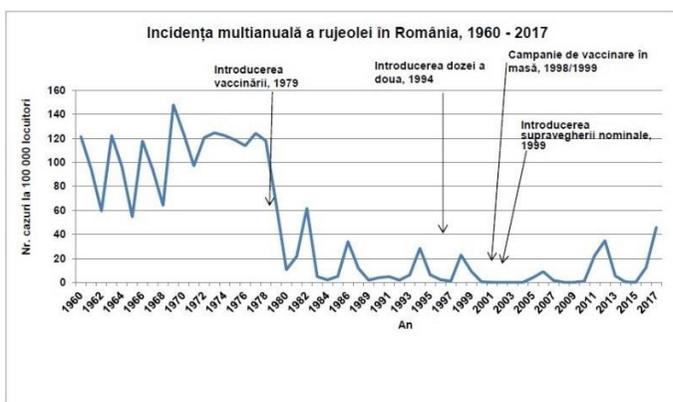


Figure 2. The multiannual incidence of measles in Romania (1960 – 2017)<sup>12</sup>

According to this graphic, we can see an increase in the number of measles cases between 2011-2013, and the most recent epidemic of measles started at the end of 2016.

The European Surveillance System reports the exact numbers, but it also warns about a possible discrepancy between the actual numbers and the ones communicated by the National Institute of Public Health in Romania.<sup>13</sup>

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of cases	5 647	3 196	352	14	8	188	4 165	6 166	1 159	59	7	1 890

Source: The European Surveillance System - ECDC. The discrepancy in the number of measles cases reported to ECDC in 2016 and published by the National Institute of Public Health in Romania may be explained by the delay in case-based reporting to ECDC, compared to the aggregated data regularly published by the National Institute of Public Health.

Table 2. Number of measles cases by year, Romania, 2005-2016

The peak of the most recent epidemic was reached in 2017 when the national incidence of measles was of 46.2%000 inhabitants, 3,8 times higher than in 2016 (12.2%000). The month with the most cases was March, with a total of 1338 reported cases of measles.

According to a report issued by the National Centre of Communicable Diseases Surveillance and Control, in 2017, the most affected by measles were the children under one-year-old (848.9%000) and the children that were not eligible for vaccination yet.<sup>14</sup>

Since the MMR vaccine introduction in Romania’s national calendar in 2005, the percentage of 95% targeted coverage WHO had set was maintained for a while.

<sup>12</sup> Institutul Național de Sănătate Publică România, [www.cnscbt.ro](http://www.cnscbt.ro).

<sup>13</sup> European Centre for Disease Prevention and Control, *Ongoing outbreak of measles in Romania*.

<sup>14</sup> Institutul Național de Sănătate Publică România, Centrul Național de Supraveghere și Control al Bolilor Transmisibile, *Analiza evoluției bolilor transmisibile aflate în supraveghere Raport pentru anul 2017* (Bucharest, 2018), <https://cnscbt.ro/index.php/rapoarte-anuale/1003-analiza-evolutiei-bolilor-transmisibile-aflate-in-supraveghere-raport-pentru-anul-2017>.

Starting with 2010, this percentage decreased year by year and in 2017 reached 87% (for the first dose) and 74.7% (for the second dose).

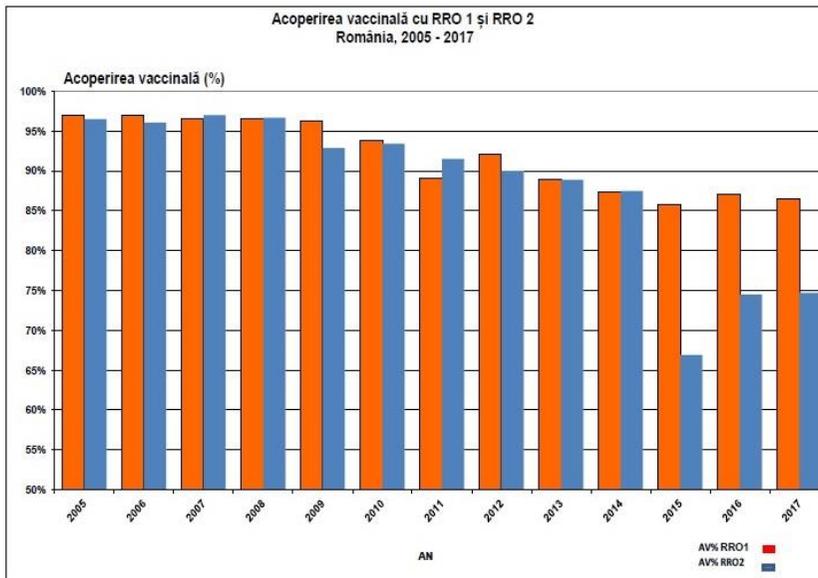


Table 3. Vaccine coverage for I dose and II dose of MMR vaccine, in Romania, between 2005 – 2017

For this decrease, the report blames the increasing lack of confidence in vaccination benefits and parents’ refusal to vaccinate their children, but it does not mention these conclusions’ source.

According to the report, the measles occurrence is higher in the following age categories: 1-4 years old (419.6%<sub>000</sub>), 5-9 years old (168.2%<sub>000</sub>), 10-14 years old (75.5%<sub>000</sub>), and 15-19 years old (47.6%<sub>000</sub>).

The highest mortality, 53.8%, was registered in children with ages below one year old. According to the same report, death occurred among unvaccinated people in the other age categories as well.

The report concludes by warning that the vaccination level remains below the optimal level and the risk of an epidemic outbreak is imminent.

### *MMR Vaccine Controversy*

Since the introduction of vaccination at the end of the 19th Century, numerous studies have been dedicated to various vaccines’ benefits and side effects.<sup>15</sup>

Various papers also analyze how immunization is perceived in diverse communities or why people are still refusing it. The 95% immunization coverage was not yet reached all over the World for several reasons related to local socio-political aspects.

<sup>15</sup> Robert M. Wolfe and Lisa K. Sharp, “Anti-Vaccinationists: Past and Present,” *British Medical Journal* 325 (2002), 430-3.

An important turning point for the MMR vaccine perception was a study published by Dr. Andrew Wakefield and colleagues in a renowned medical publication, *The Lancet*, in 1998. The study claimed a direct connection between the triple vaccine for measles, mumps and rubella and autism.<sup>16</sup>

Although the study was proved false and was withdrawn from publication, and although Andrew Wakefield lost his right to practice, his work has massively impacted the public opinion and continues to do so, being frequently cited even only to be refuted.

Wakefield's study was considered responsible for the substantial decline of vaccinated people in the early 2000s. This vaccination dropout's consequences were visible between 2012-2013, when a measles epidemic outburst in Swansea, Wales. During the epidemic, 1200 young people have been diagnosed with measles, and one person died.<sup>17</sup>

Several media and sociological studies have investigated the impact of Wakefield's article on the population to correlate it with the MMR vaccination dropout. The results show that the significant effect that Wakefield's study should also be associated with a favorable social context.<sup>18</sup> In Great Britain, where it had the most prominent influence, before the study's publication, there were disputes and debates on the necessity of the MMR vaccine and its side effects that overcome its benefits.

The single-shot MMR vaccine was introduced in Great Britain in 1989 and has reached the maximum intake level in 1995 when 92% of the children aged below two years old have been vaccinated. However, until 1997, a year before Wakefield's study was released, the vaccination rate had already decreased to 79%.<sup>19</sup>

Several content media analyses show the way media had presented the MMR vaccination when Wakefield's study was published. Guillaume L. and Bath P. A.<sup>20</sup> have done a general analysis of the frames media used for presenting the MMR vaccine, while Stöckl A. and Smajdor A.,<sup>21</sup> have focused on the role the politicians

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<sup>16</sup> A. J. Wakefield et al., "Ileal-lymphoid-nodular hyperplasia, nonspecific colitis, and pervasive developmental disorder in children," *The Lancet* 351 (1998), 637-41.

<sup>17</sup> Andrea Stöckl and Anna Smajdor, "The MMR debate in the United Kingdom: vaccine scares, statesmanship and the media," *The Politics of Vaccination* (Manchester University Press, 2017), 240-259.

<sup>18</sup> Andrea Stöckl and Anna Smajdor, "The MMR debate in the United Kingdom: vaccine scares, statesmanship and the media," in *The Politics of Vaccination*, eds. Christine Holmberg, Stuart Blume, and Paul Greenough (Manchester University Press, 2017), 240-259.

<sup>19</sup> Anna Pearce et al., "Factors Associated with Uptake Of Measles, Mumps, and Rubella Vaccine (MMR) and Use of Single Antigen Vaccines in a Contemporary UK Cohort: Prospective Cohort Study," *British Medical Journal* 336 (2008), 754.

<sup>20</sup> Louise Guillaume and Peter A. Bath, "The impact of «health scares» on parents' information needs and preferred information sources: a case study of the MMR vaccine scare," *Health Informatics Journal* 10 (1) (2004): 5-22.

<sup>21</sup> Stöckl and Smajdor, "The MMR debate in the United Kingdom."

have in generating an action model in a “modern risk society.”<sup>22</sup> They also have placed in a socio-cultural context the decreasing vaccination rate. This is a new kind of approach that adds up to the previous ones where the emphasis is placed on the role of science in society or media’s role in the population’s decision-making. In Great Britain, parents who had reserves about vaccinating their children used to use as argument Wakefield’s study, but in broader context analysis, it has been demonstrated that the seeds of concern have dropped in favorable terrain.

At the time Andrew Wakefield’s article was published, Great Britain’s public agenda was focusing on the role of political intervention in matters of science, in the context of the recent scandal related to “Bovine spongiform encephalopathy” (BSE), commonly known as “mad cow disease.” The fact that the prime minister, Tony Blair, and his wife, Cherie, refused to reveal the vaccination status of their newborn son, Leo, contributed even more to the public rejection of political intervention in parents’ decision to vaccinate their children.

Studies showed that Wakefield’s article seeded concern about a possible connection between autism and MMR vaccine in other parts of the World too, like USA, and New Zealand and Australia<sup>23</sup> and several European countries like Holland,<sup>24</sup> Denmark,<sup>25</sup> Sweden<sup>26</sup> or France.<sup>27</sup>

Lenisa V. Chang in “Information, Education, and Health Behaviors: Evidence from the MMR Vaccine Autism Controversy”<sup>28</sup> shows the results of a survey about the impact of Andrew Wakefield’s study in America. The conclusions show that a direct correlation can be set between the ample media coverage of the subject and the immunization fluctuation rates in the USA, but the only category of the public where a direct impact can be noticed is the one of the parents with a high education level. They feel they must inform themselves before making any medical decision, and after analyzing the risks and the benefits of vaccination, they opt for partial vaccination or none. Also, the MMR controversy produces negative spillovers onto other vaccines.

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<sup>22</sup> Ulrich Beck, *The Risk Society. Towards a New Modernity* (Londra: Sage Publications, 1992).

<sup>23</sup> D. Brieger et al., “Knowledge, attitudes and opinions towards measles and the MMR vaccine across two NSW cohorts,” *Australian and New Zealand Journal of Public Health* 41, 6 (2017), 641-646.

<sup>24</sup> Stuart Blume and Janneke Tump, “Evidence and Policymaking: The Introduction of MMR Vaccine in the Netherlands”, *Social Science & Medicine* 71 (2010), 1049-55; Eelko Hak et al., “Negative attitude of highly educated parents and health care workers towards future vaccinations in the Dutch childhood vaccination program,” *Vaccine* 23 (2005), 3103-3107.

<sup>25</sup> Kreesten Meldgaard Madsen et al., “A Population-based Study of Measles, Mumps, and Rubella Vaccination and Autism,” *The New England Journal of Medicine* 347 (2002).

<sup>26</sup> E. Byströma et al., “Parental attitudes and decision-making regarding MMR vaccination in an anthroposophic community in Sweden – A qualitative study,” *Vaccine* 32 (2014), 6752-6757.

<sup>27</sup> Pierre Verger et al., “Vaccine Hesitancy Among General Practitioners and Its Determinants During Controversies: A National Cross-sectional Survey in France,” *EBioMedicine* 2 (2015): 891-897.

<sup>28</sup> V. Lenisa Chang, “Information, education, and health behaviors: Evidence from the MMR vaccine autism controversy,” *Health Economics* 27 (2018), 1043-1062.

Sobo J.E. (2015) concentrates on the Waldorf community and the influence of anthroposophy, a worldview foundation to Waldorf education, in forming a cluster of unvaccinated communities.<sup>29</sup> Focused on the Waldorf parents' community, to which the researcher also belongs, the study analyses the parents' attitude towards vaccination using interviews and focus groups. The results indicate a clear rejection of vaccination on the grounds mentioned earlier, the risks being perceived higher than the benefits. In this community, it is also identified an attitude of rejection of allopath medicine, seen as reduced and reductive and an inclination towards a philosophy specific to Waldorf schools - anthropomorphism, that integrates the disease in a paradigm of necessity and normality. The study also underlines the degree of conformity to the group's norm. The community members who do not share the same beliefs and have vaccinated their children are afraid to be exposed. This category of parents prefers not to disclose this information.

Sugerman D. E. et al.<sup>30</sup> and Byströma E. et al.<sup>31</sup> also focus on the role of the anthroposophic communities in creating clusters of unvaccinated children that lead to an epidemic outbreak, even in countries like Switzerland and Sweden where 95% of vaccination rate was reached.

In Italy<sup>32</sup> or Greece<sup>33</sup> the focus was set more on political and socioeconomic factors and less on media influence and fear of side effects.

Although international studies have been made so the decreasing vaccination rate could be correlated with certain factors, in Romania there are only a few journalistic analyses of the situation, one of the best-documented being the article published in DOR magazine: "An Epidemic of Negligence", signed by Octavian Coman.<sup>34</sup>

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<sup>29</sup> J. Elisa Sobó "Social Cultivation of Vaccine Refusal and Delay among Waldorf (Steiner) School Parents," *Medical Anthropology Quarterly* 29, 3 (2015), 381-399.

<sup>30</sup> David E. Sugerman, Albert E. Barskey, Maryann G. Delea, Ismael R. Ortega-Sanchez, Daoling Bi, Kimberly J. Ralston, Paul A. Rota, Karen Waters-Montijo, and Charles W. LeBaron, "Measles Outbreak in a Highly Vaccinated Population, San Diego, 2008: Role of the Intentionally Undervaccinated," *Pediatrics* 125 (2010): 747-755.

<sup>31</sup> E. Byströma, A. Lindstrand, N. Likhite, R. Butler, M. Emmelin, "Parental attitudes and decision-making regarding MMR vaccination in an anthroposophic community in Sweden – A qualitative study," *Vaccine* 32 (2014): 6752-6757.

<sup>32</sup> M. L. Ciofi degli Atti et al., "Do changes in policy affect vaccine coverage levels? Results of a national study to evaluate childhood vaccination coverage and reasons for missed vaccination in Italy," *Vaccine* 22 (2004), 4351-4357.

<sup>33</sup> Kostas Danis et al., "Socioeconomic factors play a more important role in childhood vaccination coverage than parental perceptions: a cross-sectional study in Greece," *Vaccine* 28 (2010), 1861-1869.

<sup>34</sup> Octavian Coman, "O epidemie a neglijenței," *Decât o Revistă* 30, December 6, 2017, <https://www.dor.ro/o-epidemie-a-neglijentei-dor30/>.

The article documents the evolution of measles epidemics, from the outbreak, in a Roma community situated next to Reteag village, Bistra-Năsăud County, until 2017. The article's conclusions are summarized in the opening paragraph:

*The epidemic of measles with the highest number of deaths in the last decade constitutes a miscellany composed of a numb medical system, improvisation and discrimination.*<sup>35</sup>

This analysis follows the possible social and political factors that could have influenced the outburst of the epidemics. One of the most important is the deficient number of people vaccinated in Roma communities, approximately 54%, a result of lack of education, and the ill-treatment this category of the population receives in hospitals and from the medical employees in general, which makes them avoid as much as possible the interference with the medical system.

Among other causes for the low percentage of the vaccinated population, the leading cause of epidemics is the lack of available vaccines caused by some politically inconsistent decisions.

Neither of these conclusions is based on a thorough sociological study. The article is a journalistic investigation and a good starting point for further sociological studies on Romania's recurrent measles epidemics.

There are few studies on Romania's situation regarding the low number of vaccinated people, and the blame is attributed most of the time to the usual suspects: poverty, lack of education, and lack of vaccine stocks.

Studies of how the parents perceive the MMR vaccine and the reasons they refuse it are missing. Any further sociological research could use some key findings of how the MMR vaccine is presented by the media, the messages, and the main channels where the parents get their information. For this, but also for a communication analysis, the studies conducted abroad could help set the grounds.

### *The New Media Role in the Vaccine Controversy*

Studies indicate Mass Media as a significant factor of influence when it comes to parents' decision in connection with the MMR vaccine.<sup>36</sup> The information that had the most significant impact was the one emphasizing the side effects.<sup>37</sup>

The apparition and development of Social Media platforms massively accelerated the exchange of information and the clustering phenomenon, allowing people with the same ideas to find each other and live with the impression that *others*

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<sup>35</sup> Personal translation of the following original paragraph: "Epidemia de rujeolă cu cel mai mare număr de decese din ultimul deceniu este un amestec de amortire a sistemului medical, improvisație și discriminare."

<sup>36</sup> Guillaume and Bath, "The impact of «health scares» on parents' information."

<sup>37</sup> Roger Dobson, "Media misled the public over the MMR vaccine, study says," *BMJ.*, May 24, 326(7399) (2003), 1107.

*validate their opinions.* This phenomenon is the result of Facebook's algorithm, which selects the information a user receives based on his previous interactions and preferences:

*Recent technological development has further heightened our need to acknowledge the role of social networks, as the emergence of new social connection software and social media environments have turned the Internet into a place of considerable peer-to-peer information sharing.*<sup>38</sup>

B. G. Southwell underlines this significant influence of Social Media characteristics on health communication:

*[...] the social networks literature is a potential resource for health communication research. Humans, as a social species, rely on interpersonal contact for information, for ritualistic affirmation of beliefs and for aesthetic pleasure. Were we to frame the potential impact of mass media health campaigns solely and direct persuasive effects of broadcast messages on individuals, we would miss the extent to which interpersonal conversation can act as a vital mediator of moderator. Conversation likely amplifies broadcast messages at times and nullifies persuasion attempts at others. We likely need to understand how people exist in active social networks if we are to understand the dynamics of information flow as it relates to health behavior. Studying mass media content alone is probably not enough.*<sup>39</sup>

Social Media has a massive role in spreading information and clustering people based on their interests and affinities.<sup>40</sup> This has many implications, and important social movements have started with Social Media's help, freed from the traditional hegemony of Mass Media. However, the clustering phenomenon is responsible for an outburst of the measles epidemic in countries where the 95% level of vaccination was reached. Therefore, it is essential to follow how the news about vaccination is spreading via Social Media and how powerful its impact can be on specific social categories like pregnant women and newborn infants.<sup>41</sup>

There are several definitions of Social Media. According to these we can call Social Media activities that people reunited online are performing: sharing information and using "conversational media" which facilitate the production and the

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<sup>38</sup> Caroline Haythornthwaite, "Strong, weak, and latent ties and the impact of new media," *The Information Society* 18(5) (2002), 385-401.

<sup>39</sup> Brian G. Southwell, "Health Communication as Interdisciplinary Intersection Rather than Separate Field," *Journal of Health and Mass Communication* I, 1/2 (2009), 8-11.

<sup>40</sup> Pui-Yee Chiu et al., "Online Social Networks: Why Do «We» Use Facebook?" in *The Open Knowledge Society. A Computer Science and Information Systems Manifesto. WSKS 2008. Communications in Computer and Information Science* vol. 19, eds. Lytras M. D. et al. (Berlin, Heidelberg: Springer, 2008).

<sup>41</sup> Marcel Salathé and Shashank Khandelwal, "Assessing Vaccination Sentiments with Online Social Media: Implications for Infectious Disease Dynamics and Control," *PLoS Comput Biol* 7(10) (2011), e1002199.

transmission of media content in the form of words, photography, audio and video materials.<sup>42</sup>

Studies reveal that people mostly trust family and friends' recommendations. Social Media meets these two important coordinates: accessibility to information and endorsement from the ones we trust the most, the people we allow on our friends list.<sup>43</sup>

Safko and Brake affirm that online social media can act as an "echo chamber" where others predominately reaffirm personal opinions that affect individual medical decisions.<sup>44</sup>

In Romania, according to Reuters Digital News Report 2017, most of the population gets informed online (87%) or from Social Media (69%). This high percentage of people opting for New Media is explained by the lack of trust in Mass Media that is being perceived as corrupt and serving different political and economic interests.

*Trust in Romanian media is low in international comparison, with evidence of political and economic interference in the news agenda, not least scores of transcripts from prosecutors' files on politicians and media owners. Newsrooms compete online for readers' attention and for advertising money with Google and Facebook, with bloggers and influencers (who often do not make clear their financial interests), and with fake news and conspiracy theorists.*<sup>45</sup>

Statistics about Social Media consumption are realized monthly by ZeListMonitor,<sup>46</sup> the biggest monitoring agency for brands activities in online media from our country. ZeListMonitor places 95,000 blogs in the category of Social Media and follows. These on-line journals represent 99% of the Romanian blogs, the social networks Facebook and Twitter, 3,600 online publications, and 800,000 YouTube accounts.

According to ZeList Monitor, in June 2018, the online information usage was concentrated mainly on Facebook, the Social Media network that has reached 9,900,000 members in Romania.

Another aspect to be considered in an analysis of media content shared in New Media is the age of the people most likely to interfere with this kind of information, the one of young parents. They can be placed in the Y generation category, called Millennials, a generation born in the '80s spanning up to the beginning of year 2000.

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<sup>42</sup> Lon Safko and David K. Brake, *The Social Media Bible* (New Jersey: John Wiley & Sons, Inc., Hoboken, 2009).

<sup>43</sup> Rachel Casiday et al., "A survey of UK parental attitudes to the MMR vaccine and trust in medical authority," *Vaccine* 24 (2006), 177-184.

<sup>44</sup> Safko and Brake, *The Social Media Bible*.

<sup>45</sup> Reuters Digital News Report 2017.

<sup>46</sup> ZeListMonitor, <https://www.zelist.ro/monitor/>.

Millennials are people aged between 19 – 37, a period that coincides almost perfectly with the age interval when people tend to have children and are confronted with the decision to vaccinate their children or not.

The “Generation Y” classification is achieved by taking into consideration only the birth period. The previous ones were called: “Silent Generation” (1925 - 1945), “Baby Boomers” (1946 - 1960), “Generation X” (1961 - 1981) and “Generation Y” (born after 1981).<sup>47</sup>

According to Prensky’s Classification, generation Y can be split into the “Digital Immigrants” and the “Digital Natives”.<sup>48</sup> The “Digital Natives”, also called the “Net Generation”, are the people who were born and raised surrounded by advanced technology of information. The “Digital Immigrants” are the ones that adapted to this significant change in the evolution of humankind, a moment so crucial, that Prensky evaluates as being a technological singularity, a moment of a switch from which life and the World as we know it can no longer exist. According to Marc Prensky, the brains of the “Digital Natives” are very different from “Digital Immigrants,” and we cannot expect them to react the same because they see the information differently.

*Digital Natives are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to “serious” work.*<sup>49</sup>

“Generation Y” is also called the “Peter Pan” generation because people belonging to it tend to delay some standard maturity stages, such as not living with the parents anymore from a certain age, marriage, and starting a family. The explanation given for this bypassing attitude is the desire to avoid their parents’ mistakes and make the best decisions related to family and career.<sup>50</sup> By extrapolation, one of these decisions questioned by “Generation Y” members can be the one of vaccination.

People belonging to “Generation Y” from the Western countries have spent their entire lives surrounded by digital media, which significantly influences how they live and work. They consume online content, which they also share and create, and they play and work in this medium. They use technology for entertainment, for human interaction, and even for emotional balancing.

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<sup>47</sup> Ruth N. Bolton et al., “Understanding Generation Y and their use of social media: a review and research agenda,” *Journal of Service Management* 24 (3) (2013), 245-267.

<sup>48</sup> Mark Prensky, “Digital Natives, Digital Immigrants,” *On the Horizon* 9, 5 (2001).

<sup>49</sup> *Idem*, 42.

<sup>50</sup> Jason S. Carroll et al., “Ready or not: Criteria for Marriage Readiness Among Emerging Adults,” *Journal of Adolescent Research* 24, 3 (2009), 349-375.

There are differences in this category, depending on the economic status, the advancement of technology, the cultural, social, and political environment. Bolton, R.N. et al<sup>51</sup> underline these differences and mark a variety of singular uses of social networks if we talk about South Korea, China, or the USA while also pointing to the similarities between these remote geographic areas, already brought closer into one big global village by technology.

The economic, cultural, and social discrepancies can be observed in a single country like Romania, and therefore, a Social Media usage study cannot be made by referring to a specific territory but the level of income and education. Technology has erased the geographical borders and led to the segmentation of different criteria that should be considered when researching New Media's impact.

This means that we cannot reduce the media content to a country's production anymore. If we want to study highly educated people's behavior, we must consider the international media content, produced worldwide and written in English, a language accessible to this category.

We find ourselves in a time where online information is available anywhere there is a good connection to the Internet.<sup>52</sup>

#### *Research objectives and questions*

This research is centered on how the MMR vaccination is illustrated in the New Media in Romania and the reactions observed in Social Media. The analysis is limited to websites, blogs, online versions of printed newspapers and publications, forums, YouTube, Wikipedia, and a Social Media platform – *Facebook*.

For a primary image of how the MMR vaccine is presented in the New Media, a corpus of articles selected by their ranking on the Google pages was built. A search using the terms 'MMR vaccine' ("vaccinul ROR") was initiated and the articles presented in the first five Google pages were collected. A more detailed analysis was applied to the articles presented on the first page, taking into consideration statistics showing that the first page's results get almost 95% of web traffic, while the rest only 6%.<sup>53</sup>

The articles were classified in the database according to the following criteria: page ranking, type of website, title, author, tone of voice, and journalistic approach -

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<sup>51</sup> Ruth N. Bolton et. al., "Understanding Generation Y and their use of social media: a review and research agenda," *Journal of Service Management* 24 (3) (2013): 245-267.

<sup>52</sup> James Kite et al., "Please Like Me: Facebook and Public Health Communication," *PlosOne*, September 15 (2016).

<sup>53</sup> Madeline Jacobson, "How Far Down the Search Engine Results Page Will Most People Go?," *Leverage Marketing*, <https://www.theleverageway.com/blog/how-far-down-the-search-engine-results-page-will-most-people-go/>.

medical, political, informative, anti, or pro-vaccination. Three of these articles are posted on the Moldavian online publications, but appeared in the search due to the Romanian search term. Two of these articles appear on the second page and the other one on the third, showing that the location from where it was published has little importance and that the most important criteria are language and readership.

The classification of websites was done following the BRAT (Romanian Joint Industry Committee for Print and Internet) criteria. BRAT is “a non for profit, independent, tripartite organization for the media and advertising industry, whose members are publishers (media owners), media agencies and advertisers.”<sup>54</sup> The study used the statistics offered by SATI (Internet Audience and Traffic Measurement), a division of BRAT, dedicated to online publications. Some of the websites are not audited by BRAT, and for them, the ranking generated by an independent institution Trafic.ro was used.<sup>55</sup>

The classifications *News and analyses / Family and children / General news / Economic and financial / Health and personal care* belong to SATI. The rest, *Corporate /Local media / Medical publications / Governmental / Pro-vaccinations platforms / Religious* belong to a personal coding system. Links to forums, Facebook pages, and a Wikipedia page in the Social Media category were included. All the Moldavian articles are placed in the same category with no differentiation. From the two links to Facebook, one of them refers to a UNICEF Romania page post, and the other being a link to a Facebook event organized in the Republic of Moldova by a local publication, E-Sanatate.

From the total number of articles, most of them belong to the following categories: *News and analyses* (19%) followed by *Family and Children* (15%), *Social Media* (12%), and *General news* 10%. The following smaller percentages belong to some categories of heterogenous materials, reunited under the tags: *Corporate*, publication that belongs to a private company or organization, like the website of Regina Maria, a private medical clinic, UNICEF and ADEM, The Romanian Association of Euro- Pharmaceutical Wholesalers. These cover 8% of the articles.

Local news refer to publications from different districts of Romania, Cluj, Crișana, and Olt. These represent 6%, the same as the *Moldavian* and *Medical* publications. Equal shares of 4% represent the categories: *economic and financial news, health and personal care, governmental and pro-vaccination platforms*. A religious website represents 2% with only one article, but this one is being placed on the first page of Google search.

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<sup>54</sup> BRAT (Romanian Joint Industry Committee for Print and Internet), <https://www.brat.ro/ce-este-brat?lang=en>.

<sup>55</sup> Trafic, “Top siteuri General,” <http://www.trafic.ro>.

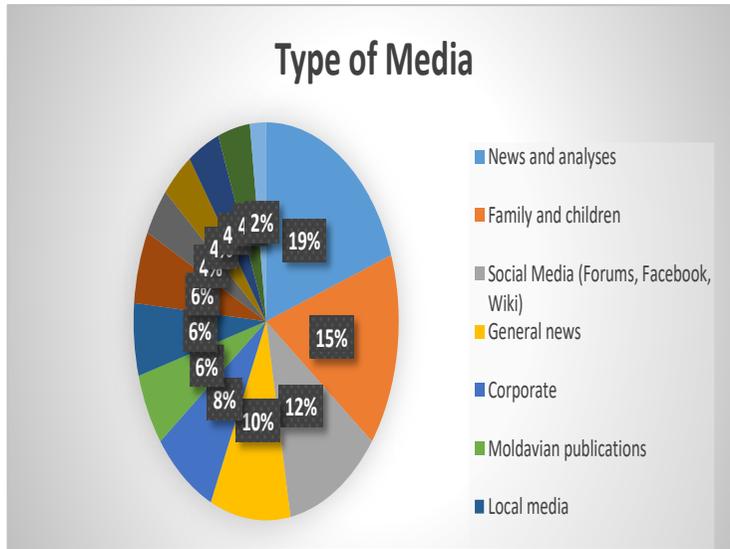


Figure 3. Type of media distribution (n=51)

The distribution on the first page shows some essential differences: *Family and children* ranks first with 28% of materials, *Health and personal care* and *News and analyses* with equal percentage, 18%, on the second place and *General news*, *Corporate*, *Governmental*, *Pro-vaccination*, and *Religious* share an equal place with 9%.

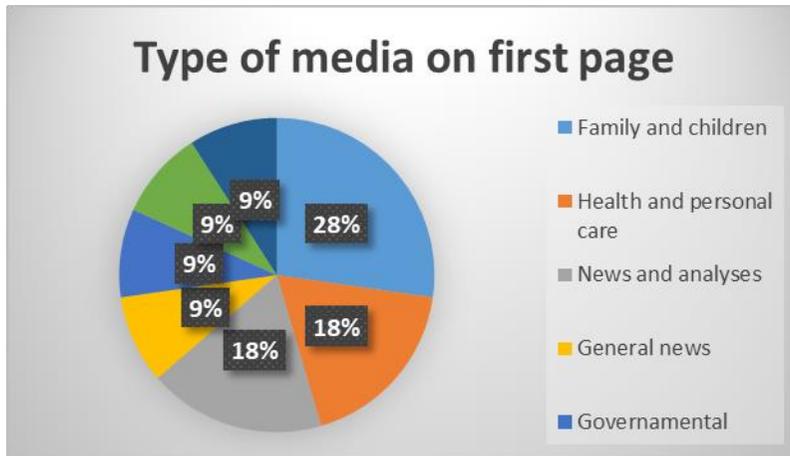


Figure 4. Type of media distribution present on the first page of Google (n=11)

After a primary analysis of the materials, the first observation is that we cannot use the same analysis rules we use for the traditional media.

Most of the articles are not signed, and we cannot attribute them to a particular editor. For the specific websites, like the ones in the category *Family and children* or *Health and personal care*, things are clear because all the websites refer to a specific category of information. However, when we are talking about “General news” or

“News and analyses,” we want to see if the political and the medical articles are written by the same person or not.

As shown in the chart below, after eliminating the medical leaflets and the article belonging to foreign publications, an almost equal number of 22 signed materials versus 19 unsigned ones have resulted.

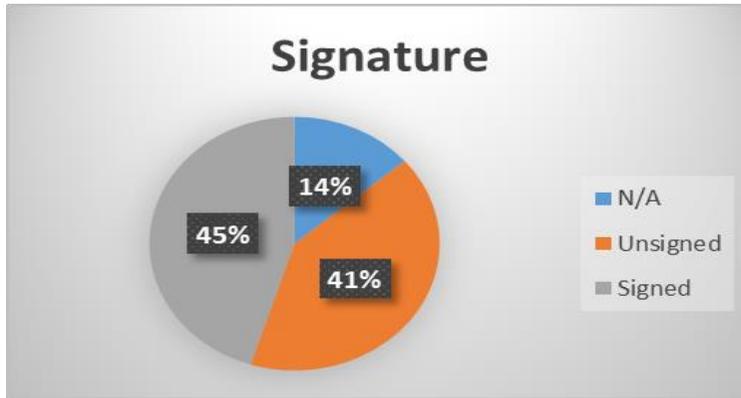


Figure 5. Distribution of articles by signature ( $n=51$ )

Another essential criterion in content analysis is the time of publication. From the total corpus of 52 articles selected, 22 do not have a date. This aspect makes it very difficult for a retroactive investigation to find out, for example, which articles were popular on the Internet in 2015, before the outburst of the epidemics in 2016.

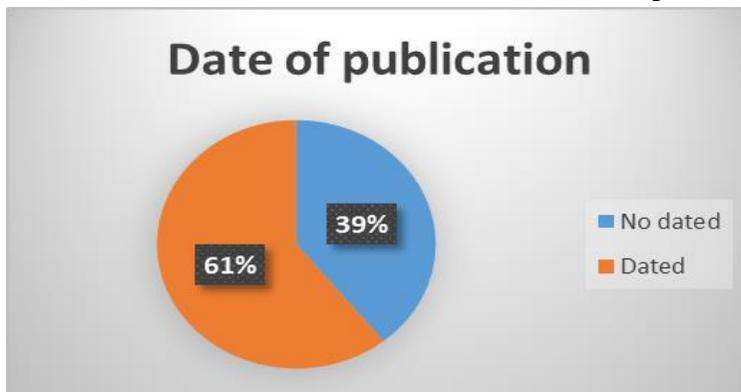


Figure 6. Distribution of articles by date of publication ( $n=51$ )

The websites' ranking in their category and the total number of visitors are also not relevant if we consider the fact the first article in every search was published by a website not monitored by SATI, the official organism of control.

Websites with a lower number of visitors in their category, like Realitatea.net (ranked 6 in the category *News and analyses*) with an article published on 15.05.2018, and Hotnews.ro (ranked 4, in *News and analyses*), with an article published on 27.02.2018, are shown on the first page. These pages are outclassing websites with a higher number of visitors, like Digi24.ro (ranked 1, in *News and analyses*), even though the date of publication is more recent, such as an article published on

28.07.2018 appears on the second page, and an article published on 5.09.2018 appears on the third page. Another example is EVZ.ro, ranked 3rd in the “News and analyses” category, considering the number of visitors criterion, which appears on the second page with an article published on 27.07.2018.

From the total number of 51 articles, 20 (39%) have a neutral, informative approach, 5 are medical leaflets (10%), eight approaches the side-effects topic (15%), 6 (12%) refer to a specific situation, the spreading of leaflets claiming that vaccines are made from aborted fetuses, 5 (10%) mention the role of the Ministry of Health in the delay of vaccination process, 4 (8%) are lobbying for vaccination and three against it (6%).

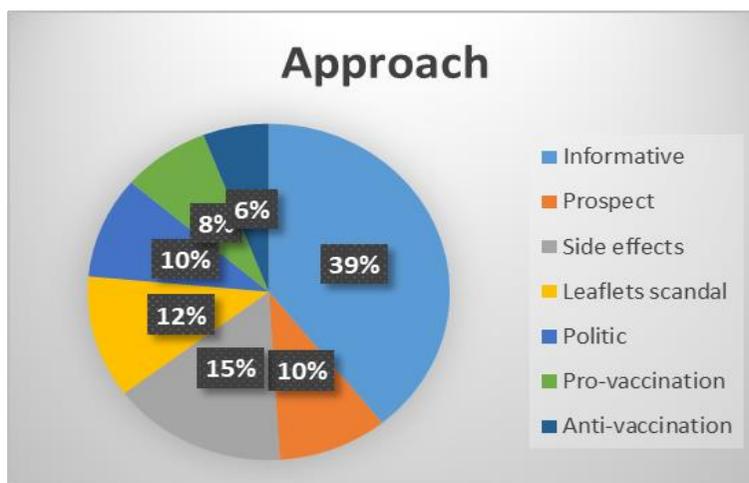


Figure 7. Distribution of articles by approach ( $n=51$ )

The merely informative materials and medical leaflets sum up almost half of the materials, showing a clear interest in information from the readers’ side.

This category is followed by one of the articles describing side effects, in line with the need to cover all the aspects and being fully informed before making any decision. The articles describing side effects hold 46% of the ones published on Google’s first page; the rest (27%) are informative and PRIORIX vaccine medical leaflets (27%).

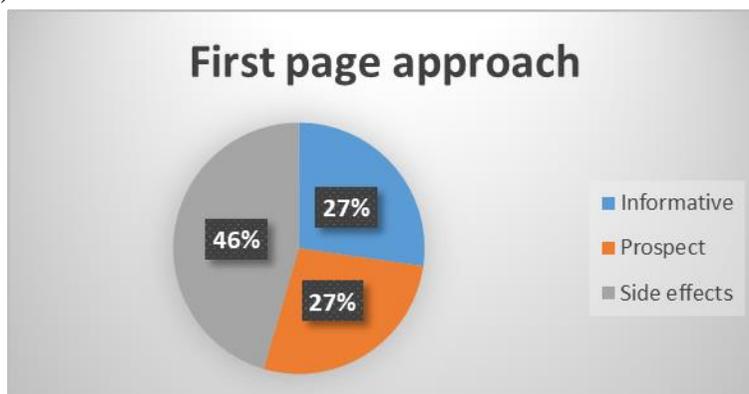


Figure 8. Distribution of articles on the first page of Google by approach ( $n=11$ )

The next high percentage of articles, from the total number of 51, is the one dedicated to a specific situation: leaflets copying a pro-vaccination campaign started by UNICEF on the graphic level (same colors, layout, picture, and the logos of UNICEF, WHO, and Ministry of Health), but with a text describing the composition of MMR vaccine as containing aborted fetuses cells, among others.

All the articles on this topic have been published on September 5, 2018, so they are more recent than those on the first page, but they appear in the search only on the second, third, and fifth pages. The article that appears on the second page is published by Adevarul.ro, a publication that ranks 2nd in the General News category, the articles on the third page are published by Ziare.com, a news aggregator, ranked fifth in *News and Analyses category*, and on Digi24.ro, the website with the higher traffic in *News and Analyses category*, but which appears two positions bellow Ziare.com on the search engine.

The articles with references to political implications represent 10% of the total, but except for one published on July 27, 2018, the rest are two years old or more.

The materials in favor and against vaccination are almost equal, representing 8% and, respectively, 6% from the entire data corpus.

Taking into consideration the statistics saying that the first page's engine results are read in a proportion of almost 95%, while starting with the second page, the readership decreases to 6%, further on are selected for a more detailed analysis only the articles delivered by the Google search engine on the first page.

The first article on the first page is published by the online publication *Mamica.ro*<sup>56</sup> ("mămica" meaning "mommy") with the headline "MMR Vaccine (Measles – Mumps – Rubella)".<sup>57</sup> The website *Mamica.ro* is not monitored by SATI but appears on Trafic.ro as holding the 7<sup>th</sup> place in the category *Family/Children*, 99<sup>th</sup> place in the category *General* and sixth in *Communities*. For the unity of coding, the SATI classification *Family and children* was used in the database.

The article is not signed nor dated. It offers detailed information about each disease and the MMR vaccine. It also mentions the controversy started by dr. Andrew Wakefield's study that relates autism to the MMR vaccine.

The article objectively presents all the information and, in the end, launches two questions for the readers: Did they vaccinate their children? Moreover, If they vaccinated their children, did they notice any side effects? The questions generated seven answers, facilitated by a Facebook plug-in; the readers comment using their Facebook profile.

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<sup>56</sup> Mamica, "Vaccinul ROR (rujeola-oreion-rubeola)," <https://www.mamica.ro/vaccinul-ror/>.

<sup>57</sup> Original "Vaccinul ROR (rujeola – oreion - rubeola)".

Some of the answers only relate to some mild side effects, but others create a controversy between pro and anti-vaccination partisans.

After two weeks, the search was repeated to observe if the articles change their order. The search was also conducted in an incognito Google window to see if the results were influenced by the profiling, based on previous interests, online orders, articles, and websites usually visited. The Google algorithm is based on our personal preferences, and different people receive different results when they initiate a Google search.<sup>58</sup>

In each of the two searches, this article resulted first on the first page. There was a slight modification in the order of some articles: one of them coming on the first page from the second, one oscillating from the second page to the third, and on the second again, a new entry on the first page and the second page and four on the fourth page while an article moved from the second page to the third. The date's omission is a technique used by online publications to circulate their content already available on their pages, in order not to seem outdated. Because of this, we cannot evaluate if their date influences their ranking somehow.<sup>59</sup> This aspect makes online research during a specific past period almost impossible and confuses the reader who sees alarmist headlines which refers to a situation from two years ago.

The second article on the first page is six months old and was published by *Hotnews.ro*<sup>60</sup> ([www.hotnews.ro](http://www.hotnews.ro)) on the 27th of July 2018. The website belongs to SATI's category *News and Analyses*. The title cites an INSP (Institutul Național de Sănătate Publică – The National Institute of Public Health) statement saying that the MMR vaccine registers the highest rate of refusals, although the measles epidemic has made 59 victims, consisting mainly of newborn babies.

The article states that a higher number of refusals is registered in the urban area as opposed to the rural parts of the country and presents statistics regarding vaccinated children for every type of vaccine, not only MMR and the reasons for which the rest of the population is not yet vaccinated.

The article allows comments, and here again, polemics between people who are in favour or against vaccination start. The comments are placed in the website's comments section, and the people who are expressing their thoughts cannot be

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<sup>58</sup> Google, "Cum funcționează algoritmul de căutare," <https://www.google.com/search/howsearchworks/algorithms/>.

<sup>59</sup> Rob Nightingale, "Find the Date of a Published Post with These Insanely Simple Tips," *Makeuseof*, November 6, 2015, <https://www.makeuseof.com/tag/find-date-published-post-insanely-simple-tips/>.

<sup>60</sup> Alina Neagu, "Date oficiale INSP: Vaccinul ROR are cea mai mare rată de refuz dintre vaccinurile din România, chiar dacă epidemia de rujeolă a făcut 59 de morți, majoritatea bebeluși nevaccinați," *HotNews.ro*, July 27, 2018, <https://www.hotnews.ro/stiri-sanatate-22589375-date-oficiale-insp-vaccinul-ror-are-cea-mai-mare-rat-refuz-dintre-vaccinurile-din-romnia-chiar-dac-epidemia-rujeol-cut-59-mor-majoritatea-bebelu-nevaccina.htm#self>.

identified since they are generally using a nickname of just the first name; they do not have a picture attached either. For example, in the first case, the comments are made using the Facebook profiles, allowing to conduct further research on how these people are communicating on their pages, or groups, about vaccination.

The article ranked third on the first page of Google is published by Realitatea.net, a website from the *News and Analyses* category, also. Although Realitatea.net is classified as a *News and Analyses* type of website, the material published is almost identical to the one published on Mamica.ro. Almost the entire article copies the first one (or vice versa, we cannot tell), and it is not signed either. Differently from the first one, this one does not end with questions for the readers because the platform does not allow commentaries.

CSID.ro publishes the fourth and the fifth articles on the first page (*Ce se întâmplă, doctore?*, meaning “What's happening, Doctor?”), an online publication monitored by SATI and classified in the category *Health and personal care*.

The first article, with the title “Six Risk Factors for Autism: the MMR Vaccine Has Nothing to Do with It,”<sup>61</sup> is a material about autism, not the MMR vaccination. The article presents various studies demonstrating that the MMR vaccine cannot be a cause for autistic disorder and mentions six other possible explanations. Paula Rotaru signs the article. The platform does not allow comments.

The second material from *CSID.ro*, and the fifth on the Google's first page, is the prospect of PRIORIX, a vaccine for measles and rubella. GlaxoSmithKline Biologicals S.A., the pharmaceutical company that distributes the vaccine, is indicated as an article source.

The sixth article is published by *Click.ro*, a website classified by SATI in the category *General News*, under the title “Adela Popescu Has Vaccinated Her Little Boy and Had Received a Lot of Critiques. Here Is How She Answered”. Adela Popescu is a Romanian celebrity, actress, and T.V. host. The material presents part of an article written on her blog and posted on Facebook, the comments she received, and how she answered. A direct link to the actress's blog post is included in the material. Although it offers the readers this possibility via the earlier mentioned Facebook plugin, the article has no comments.

The seventh material was not on the first page from the beginning - it appeared after a week. It is a material published by *Desprevaccin.ro* (“despre vaccin” means “about vaccine”), the official website dedicated to vaccination, endorsed by the Ministry of Health. The link sends the reader to a page where two medical leaflets about the vaccine are presented. No comments are allowed on this platform.

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<sup>61</sup> Paula Rotaru, “6 factori de risc pentru autism: vaccinul ROR nu are nicio legătură cu apariția autismului!” *Ce se întâmplă, doctore?* 3 May, 2017, <https://www.csid.ro/health/sanatate/6-factori-de-risc-pentru-autism-vaccinul-ror-nu-are-nicio-legatura-cu-aparitia-autismului-16247738>.

Next on Google's first page there is a link to a medical leaflet of PRIORIX published by ANM (The National Agency of Medicines and Medical Devices).

The last three articles present the side effects of vaccination from different angles or degrees of paroxysm. *Smartandhappychild.ro*,<sup>62</sup> a website that is not monitored by SATI, or by Trafic.ro, has published the first article. The article links to another one where the side effects of the diseases prevented by the MMR vaccine are presented. This article does not come up in the first five pages of Google after searching the term "MMR vaccine," but it focuses on the correlation between the MMR vaccine and autism. The articles on this site are not dated nor signed. The Facebook plug-in facilitates the comments.

The following article is published by *Totuldespreame.ro* with the title "The Side Effects of the Vaccines. What Kind of Vaccines Have the Most Side Effects? How Do You Control Them?"<sup>63</sup> SATI classifies the website in the "Family and children" category. The purpose of the material is to guide the parents concerned with the vaccines' side effects and demolish some myths of overrated side effects. The material is based on the NHS – National Health Service recommendations and those of several Romanian doctors.

The article is not dated, but it finishes with two links to the 2017 vaccination scheme, an information from two years ago. The last article on the first page of the Google search engine belongs to *Ortodoxinfo.ro* a religious portal, not monitored by SATI or by Trafic.ro, either. The title is "Andrei Was VACCINATED with MMR Vaccine Two Weeks Ago. Now He Is STRUGGLING Between Life and Death. The Doctors Have Asked for the Parents' Approval to UNPLUG the Machines and to HARVEST His ORGANS."<sup>64</sup> The article begins with an update saying that the editors have been deceived in the first articles they wrote. This initial article, which can be read below the announcement, signals the case of a woman from Satu Mare, who had posted on Facebook the case of her little boy who suffered from convulsions and meningitis after the MMR vaccine was administered to him. She went to the doctors who did not treat him, his condition deteriorated, and now they insist on unplugging him from the machines and harvesting his organs. The editors found out that the case was fake and now are blaming the ones they are calling pro-vaxxers for misleading

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<sup>62</sup> Bogdan Ivănescu, "Duce vaccinarea ROR la autism?," *smart happy child*, <https://smartandhappychild.ro/duce-vaccinarea-ror-la-autism>.

<sup>63</sup> In original: "Efectele adverse ale vaccinurilor. Ce imunizări au avut cele mai multe reacții nedorite? Cum le controlați."

<sup>64</sup> In original: "Andrei a fost VACCINAT cu ROR acum 2 săptămâni. Acum se ZBATE între viață și moarte. Medicii au cerut acceptul părinților pentru DECONNECTAREA de la aparate și pentru PRELEVAREA de ORGANE."

them, showing a severe lack of understanding of who a pro and anti-vaxxer is and falsely informing the public without taking any responsibility.

### *Conclusions*

The way the articles, rendered by the Google search engine as most relevant, approach the MMR vaccine subject shows a clear interest and concern about the side effects of this. The three medical leaflets present on the first page show the need for information of those who have accessed these links so often that the Google search engine has placed them to the first page. The interest in medical leaflets shows a clear interest for information, not for a specialist's opinion. The parents want to decide for themselves and need to be informed, rather than inquire about the editors' opinion.

The fear of side effects is shown in the high percentage of the articles presenting these aspects.

Almost all the informative articles have a dedicated section to side effects, showing a common ground with the side effects category that already covers almost half of the materials offering a general impression of danger associated with the MMR vaccination.

Stöckl A. and Smajdor A.<sup>65</sup> state in their report of the MMR debate in the U.K. media that the simple mention of a correlation between autism or other side effects with MMR vaccine can harm, even though the mentioning is meant to decline the correlation. Although the articles try to demonstrate that the vaccines' side effects are mild, or a connection between the vaccination and the autism cannot be demonstrated, the public could remain with the impression that the vaccines have side effects and there could be a connection between autism and MMR vaccination, although it has not been proved yet.

Moreover, the headlines, trying to attract more clicks, present an exaggerated danger, good examples, in this case, being the headlines of *Ortodoxinfo.ro* or *Totuldespreame.ro*.

Even though *Ortodoxinfo.ro* signals a fake piece of news in the first paragraph, it keeps the alarmist headline from the beginning, and *Totuldespreame.ro*, which presents a balanced opinion in the article, has an alarmist headline that leaves a general impression of danger at a first glance.

This paper has not covered the comments that some articles include, comments facilitated by Facebook widgets or the forums rendered by the search, where the tone of voice and approach of each side, pro and anti-vaccination is visible, this being the subject of a future research project.

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<sup>65</sup> Stöckl and Smajdor, "The MMR debate in the United Kingdom."

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