unicef

Regional Office for Central and Eastern Europe
and the Commonwealth of Independent States

Social and Civic Media Section, DOC, NY HQ

TRACKING ANTI VACCINATION SENTIMENT IN EASTERN EUROPEAN SOCIAL MEDIA NETWORKS

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"A lie can travel halfway around the world while the truth is putting on its shoes."

Mark Twain's quote is more relevant than ever in times of online communication, where information or misinformation, bundled in bits and bytes, streams around the earth within seconds.

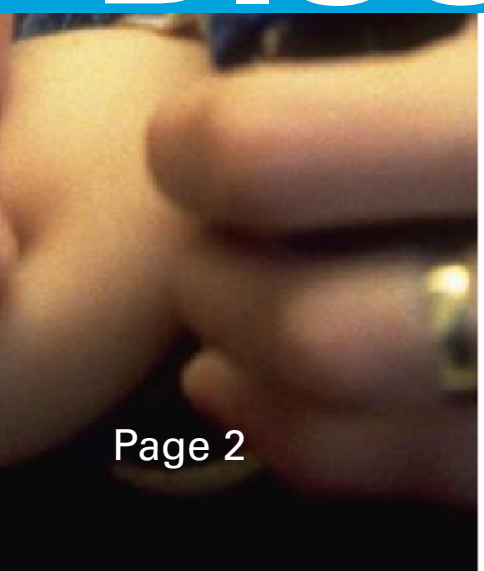
SUMMARY

This UNICEF working paper aims to track and analyse online anti-vaccination sentiment in social media networks by examining conversations across social media in English, Russian, Romanian and Polish.

The findings support the assumption that parents actively use social networks and blogs to inform their decisions on vaccinating their children.

The paper proposes a research model that detects and clusters commonly-used keywords and intensity of user interaction. The end goal is the development of targeted and efficient engagement strategies for health and communication experts in the field as well as for partner organisations.

DISCLAIMER



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RATIONALE

Over the past few years, the region of Central and Eastern Europe and the Commonwealth of Independent States has been troubled by the rise of a strong anti-vaccine sentiment, particularly via the internet. Wide ranging in origin, motive, source, and specific objectives, this online sentiment has succeeded in influencing the vaccination decisions of young parents, in many instances negatively.

A number of factors are at play in this online anti-vaccine sentiment.

First, vaccination coverage in this region is generally high. As a result, vaccine-preventable childhood diseases like polio and measles have been absent in most countries for the past few decades. This has led to complacency toward the diseases and has unfortunately made vaccines, rather than the diseases, the focus of debate and discussion.

Meanwhile, poorly-managed immunization campaigns in some countries have caused widespread mistrust of vaccines and government vaccination programs. Most countries have run sluggish, high-handed public communication campaigns while avoiding transparent dialogue with the public on possible side effects, coincidental adverse events and other safety issues. Moreover, when new vaccines have been introduced, they have often just exacerbated the public's existing doubts, hesitations or outright resistance.

Into this mix, rapid penetration of the internet in the region has provided a powerful, pervasive platform for anti-vaccine messages to be disseminated. Rooted in scientific and pseudo-scientific online sources of information, messages are often manipulated and misinterpreted, undermining the confidence of parents and causing them to question the need for, and efficiency of, vaccines. The result is hesitation towards vaccination, which in large numbers poses a serious threat to the health and rights of children.

This paper aims to examine this rapidly growing phenomenon and its global lessons. Depending on the nature of the problem, special strategies need to be developed to tactically address and counter, diffuse or mitigate its impact on ordinary parents. The prevailing approach of most governments in largely ignoring these forces is unlikely to address this growing phenomenon.

Governments, international agencies and other partners - in particular the medical community - need to combine forces to identify the source and arguments of these online influences, map the extent to which they control negative decisions, develop more effective communication strategies and ultimately reverse this counterproductive trend.

INTRODUCTION

The first part of this paper describes how anti-vaccination groups communicate and how social networks connect concerned parents in new ways. The second part emphasizes the role of social media monitoring in strategic communication, based on understanding audience needs.

2.1 Social media: The conversation shifts

The rise of social networks has changed both the way we communicate and the way we consume information. Even within the relatively recent internet era, a major evolution has occurred: In the initial phase known as Web 1.0, users by-and-large consumed online information passively. Now, in the age of social media and Web 2.0, the internet is increasingly used for participation, interaction, conversation and community building[1].

At the same time, conversations or social interactions that used to occur in community centres, streets, markets and households have partly shifted to social media[2]. Parents, for instance, suddenly have an array of collaborative social media tools with which to create, edit, upload and share opinions with their friends, peers and the wider community. These conversations are recorded, archived and publicly available.

2.2 Social media: Fertile ground for anti-vaccination sentiment

In today's information age, anyone with access to the internet can 'publish' their thoughts and opinions. On health matters in particular, the public increasingly searches online for information to support or counter specialised, expert knowledge in medicine[3].

Due to the open nature of user participation, health messages, concerns and misinformation can spread across the globe in a rapid, efficient manner[4]. In this way, social media may influence vaccination decisions by delivering both scientific and pseudo-scientific information that alters the perceived personal risk of both vaccine-preventable diseases and vaccination side effects.

[1] Constantinides et al, 2007
[2] Phillips et al, 2009; Brown, 2009
[3] Kata, 2012
[4] Betsch et al, 2012

In addition to this accelerated flow of information (whether accurate or not), social media messages tend to resonate particularly well among users who read or post personal stories that contain high emotional appeal. This holds true for anti-vaccination messages too.

In other words, both logistically and qualitatively, social media is intensifying the reach and power of anti-vaccination messages. Negative reactions to vaccines are increasingly being shared across online platforms.

All of this leads to a frustrating predicament and critical challenge: Immunizations protect people from deadly, contagious diseases such as measles, whooping cough and polio. But parents influenced by anti-vaccination sentiment often believe vaccines cause autism, brain damage, HIV and other conditions, and have begun refusing them for their children. As a consequence, health workers face misinformed, angry parents, and countries face outbreaks of out-dated diseases and preventable childhood deaths[5].

Why do anti-vaccination messages resonate with so many parents in the first place? Parental hesitation regarding vaccinations is thought to stem from two key emotions: fear and distrust:

"*Vaccination is a scary act for many children and parents. A biological agent is injected into the child. The way the biological agent works in the child's body is for most people unclear, which appeals to parents' fears. The high level of distrust stems from the intersection of government, medicine and pharmaceutical industry. The nature of its act and the fact that vaccinations are mostly compulsory leads to worries among citizens.*" (Seth Mnookin, 2011)

This distrust, along with the interactive nature of social media, suggests an urgent need for health workers to become attuned to arguments and concerns of parents in different locations and of various cultural backgrounds. To achieve more synergistic relationships with an audience, organisations need to shift their communications strategy from 'getting attention' to 'giving attention'[6].

Compounding this challenge is the fact that some anti-vaccination groups are not merely sceptics or devil's advocates, but operate in an organized, deliberate and even ideological manner.

These anti-vaccination groups often employ heavy-handed

[5] Melnick, 2011
[6] Chaffrey et al, 2008

communication tactics when dealing with opponents: they delete critical comments on controlled media channels, such as blogs[7] ; they mobilize to complain about scientists and writers critical of their cause; sometimes they go going as far as to take legal action to prohibit the publishing of pro-vaccine material.

Governments and organisations aim to keep parents accurately informed about vaccinating their children. As more of the public conversation – indeed battle – takes place across social media, there is an urgent need to understand this online landscape. This, in turn, requires the use of effective monitoring tools.

2.3 Social media monitoring

Social media analysis plays an important strategic role in understanding new forms of user-generated content[8] . Indeed, this type of monitoring has become a leading trend in Marketing, PR, political campaigns, financial markets and other sectors. As demand for this kind of data increases, more monitoring tools are becoming available.

These tools search social networks for relevant content, and archive the publicly available conversation in a database. Researchers conduct their internet analysis primarily by formulating combinations of keywords that can be placed in relation and weighted for importance. There are four different types of social media monitoring:

- Monitoring by volume looks at the amount of mentions, views and posts a topic, organization or user receives.
- Monitoring by channels maps and examines the various networks that users use to exchange content.
- Monitoring by engagement seeks deeper insight into how many users actually respond, like, share and participate with the content.
- Monitoring by sentiment analysis is a qualitative approach that uses word libraries to detect positive or negative attitudes by users towards an issue[9].

The first phase in social media monitoring is listening to what users say, because in order, for instance, to engage effectively with parents on social networks, it is important to know what they are talking about[10].

[7] Kata, 2012
[8] Cooke et al, 2008
[9] The approach must employ qualitative analysis as machines are not able to track sarcasm or slang.
[10] Kotler et al, 2007

Social media monitoring is a young discipline that began just a few years ago, and in its initial phase the practice faced a number of challenges. Data was very complex, so first generation monitoring tools produced results that were unstructured and generally overwhelming[11].

Even when that data was sorted and structured, organizations struggled to generate actionable management recommendations from it[12].

Since that time, however, social media professionals and research communities have made steady progress in overcoming the early challenges.

2.4 Influencers

Recent studies on social media networks emphasize the central role played by influential individuals in shaping attitudes and disseminating information[13]. Indeed, it is argued that a group of such 'influencers' is responsible for driving trends, influencing public opinion and recommending products[14]. One study found that 78% of consumers trusted social peer recommendations, while just 14% trusted advertisements[15]. Intensive interaction and content sharing through social media means that an audience instinctively determines its own opinion leaders.

What makes opinion leaders particularly interesting and important from our perspective is that they add their personal interpretation to the media content and pass it on to their audience. Depending on whether these influencers speak responsibly or not, this can have positive or negative impact on the goal of disseminating accurate information.

In his book The Panic Virus, journalist Seth Mnookin offers some examples of controversial influencers: A British gastroenterologist, Andrew Wakefield, entered into the vaccine discourse and alleged that the measles-mumps-rubella vaccine might cause autism. The medical community eventually dispelled his arguments and he lost his medical license. For a decade Wakefield - though not a public health specialist - very successfully disseminated misleading information and garnered a significant social media following. Meanwhile, actress and model Jenny McCarthy has become another self-proclaimed expert on vaccine safety. Through frequent public appearances she has positioned herself as an

[11] Wiesenfeld et al, 2010
[12] Owyang et al, 2010
[13] Tsang et al, 2005; Kiss et al, 2008; Bodendorf et al, 2010
[14] Keller and Berry, 2003
[15] Qualman, 2010

educated, internet-savvy mother set on challenging the medical establishment's information about vaccinations. This, too, has helped fuel the recent growth in anti-vaccination sentiments.

The public following and 'authority' gained by Wakefield and McCarthy demonstrate how with the proliferation of online channels and the user as the centre of attention, it becomes difficult for information seekers to differentiate between professional and amateur content[16]. By the time the record is set straight, trust in immunization is been partly destroyed.

Fostering the positive opinion of influencers in communities can have a disproportionately large impact in terms of online reputation[17]. Though they may not know each other in the real world, and despite ever-expanding advertisement platforms and sources, consumers around the world still place their greatest trust in other consumers[18]. Audiences listen to opinion leaders because they are known to be independent, credible and loyal to their peers[19].

Identifying and 'influencing the influencers' of the social media conversation in the region should therefore be part of any effective strategy to reinforce positive messages in the vaccination debate.

RESEARCH OBJECTIVES

Though the internet is increasingly used to search for health information, a number of questions about social media and vaccination decisions are still unanswered: Which channels are used by anti-vaccination groups? What are the key arguments and conversation themes? What makes anti-vaccination messages appealing to parents? Who are the opinion leaders in online discussions? What are the best strategies to respond to anti-vaccination arguments?

This paper seeks to understand the internal dynamics of anti-vaccination sentiment in social media networks in Eastern

[16] Cooke et al, 2008
[17] Ryan et al, 2009
[18] Nielsen, 2009
[19] Weiman, 1994

Europe[20]. These insights are expected to help health workers, partners and national governments to develop appropriate response strategies in order to convince the public of the value, effectiveness and safety of vaccinations.

The objectives of this research are:

1. To monitor social media networks, consolidate existing data and information from partners.
2. To categorize and analyse conversation themes, based on volume of discussion, influence, engagement and audience demographic as appropriate.
3. To identify influencers in the different language groups and platforms.
4. To contribute to a set of recommended strategies to address specific anti-vaccine sentiment around the various conversation themes.

This content analysis is expected to help us understand the motivations and mind sets behind the sentiment, and offer clues that can inform the development of a strategy to effectively address the phenomenon.

The research is also expected to help drawing comparisons between the anti-vaccination sentiment phenomenon and similar sentiments expressed against interventions in nutrition, child protection and other areas of UNICEF practice.

This paper is supported by UNICEF Department of Communication in New York and UNICEF Regional Office for Central and Eastern Europe and the Commonwealth of Independent States. The region covers 22 countries and territories: Albania, Armenia, Azerbaijan, Belarus, Bosnia & Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo (UN Administered region), Kyrgyzstan, TFYR Macedonia, Moldova, Montenegro, Romania, The Russian Federation, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan. UNICEF does not have a country programme in the Russia Federation but is in discussions to develop a new mode of engagement.

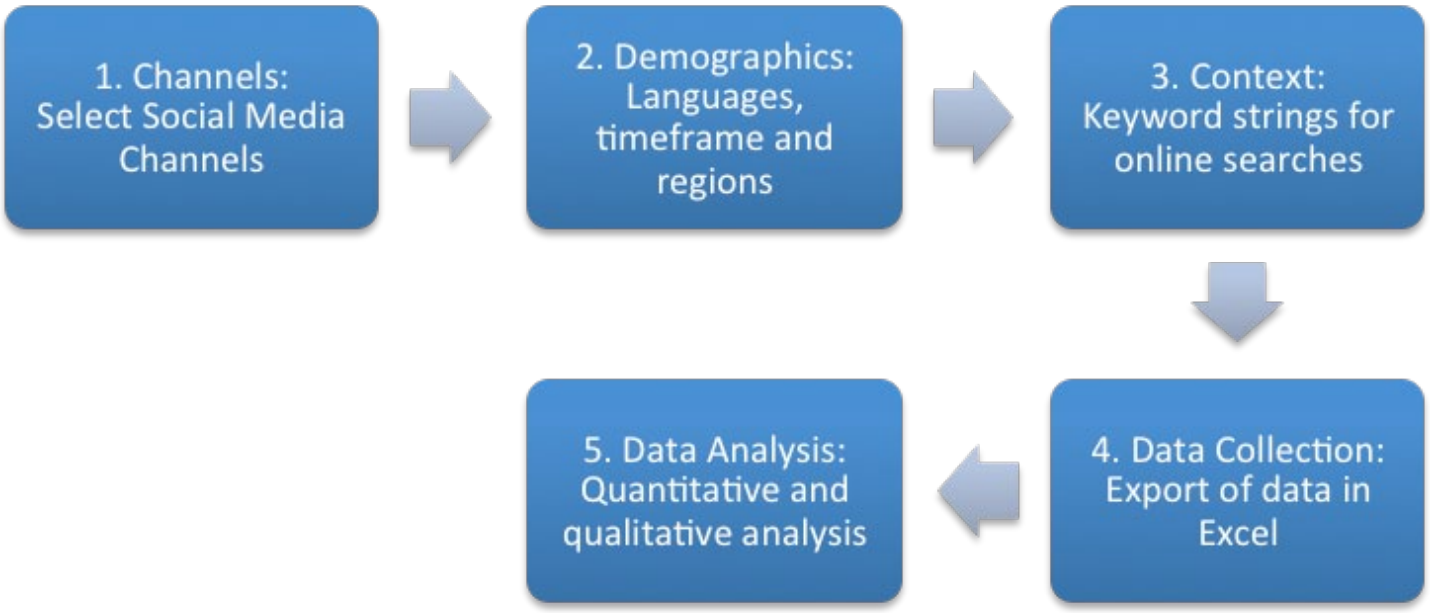


Figure 1: Research Process for data gathering and analysis.

METHODOLOGY

In order to assess the dynamics of the anti-vaccination sentiments in the four languages, a systematic mapping and content analysis via social media monitoring is proposed. For the purpose of stakeholder monitoring in social media, a combination of descriptive and exploratory methods in form of quantitative and qualitative observation is proposed. According Wiesenfeld, Bush and Skidar (2010) it is reasonable to combine both methods because social media monitoring offers the richness of qualitative research, with the sample sizes of quantitative research. It may also give the opportunity to overcome problems associated with each research method in order to understand stakeholders' dynamics in social media.

4.1 Descriptive and Explorative Research Design

The descriptive methodology involves recording the activities of users and events in a systematic manner. Information is recorded as events occur and archived. Descriptive research in this case involves:

- Aggregating text from public accessible social networks in in English, Russian, Polish and Romanian language.
- Cleaning and categorizing the data over time. The data is categorized and analysed into reoccurring conversation themes, based on volume of posts, engagement and audience demographic as appropriate.

The exploratory methodology follows the descriptive research to allow for the interpretation of patterns and to provide background understanding of sentiment and attitudes of users. The results of the structured observation will be put into context by the human judgement of the researcher through the participant observation. In this research, the researcher will be a complete observer and will not interact with the users during the participant observation (Saunders et al, 2009).

4.2 Data Collection

Traditional sampling techniques such as random, convenience or judgemental sampling are difficult to apply to a fluid social media environment. On top of the social media measurement process, the selected social media channels feed into the sample set. The posts are further categorized into different issue arenas that will be associated with relevant stakeholders. Figure 1 presents the data collection process for monitoring stakeholders in social media.
The process contains the following six steps:

1. *Channels:* The first step of the data collection process involved the selection of relevant social media channels. Social media monitoring is instead generally considered to provide a complete set of all contributors, because tools like Radian6 or Sysomos are designed to capture a wide range of social media channels, such as blogs, forums, Twitter, Tumblr, Youtube and Facebook.

2. *Demographics:* The software gathered relevant posts that were posted in English, Russian, Polish and Romanian language[3] during the period of 1 May and 30 July 2012. Posts could be submitted from all regions worldwide.

3. *Context:* The quality of data collection is determined by how well the collected data is gathered with regards to formulated searches. Keyword logic and search profiles were employed to filter the data. The full list of keyword combination can be found in Appendix A.

[3]The approach must employ qualitative analysis as machines are not able to track sarcasm or slang.

4. *Data Collection:* Relevant social media mentions that contained an issue-related keyword in relation to a stakeholder-related keyword was archived in the database. The list of relevant mentions was stored chronologically and assigned an ID. The full list of exported information about each mention was stored in a separate EXCEL file.

5. *Data Analysis:* The empirical application and content analysis of the relevant posts can be found in Chapter 6.

4.3 Limitations

There are limitations in terms of reliability and validity of the recorded data. The data collection covers a three-months period. There is a need for caution when generalizing the data because events and evolution of discussions may alter the findings in other time periods. Therefore, limitations in reliability refer to reproducibility of research results. Reliability in the extent to which measures are free from error and therefore provide consistent results, such as the consistency of data availability in social media monitoring, is the second limitations. Quantitative observation has relatively high reliability because it reduces the potential for observer bias and enhances the reliability of data (Malhorta et al, 2007).

However, social media monitoring might carry the risk of monitoring bias, as the relevant posts are extracted through keyword logic that is developed by the researcher. The collected data cannot be regarded as complete. For example, the share of Russian-speaking discussions seems to be fairly low compared to the amount of users accessing social media. Governmental control and censorship might also be contributing for lower volumes.
The external validity, which is defined as the extent to which the research results are applicable to other research settings (Malhotra et al, 2007), is relatively low. Because of the richness of data, the sampling needs to be based on the experience of the researcher. As a disadvantage, the lack of established sampling technique in social media limits the ability to generalize the findings to other relevant issue arenas or stakeholders in the population. However, the ability to generalize the results was enhanced by careful use of the theoretical terms and relationships in the stakeholder literature (especially Freeman, 1984; Mitchell et al, 1997; Luoma-aho et al, 2010; Owyang et al, 2010).

4.4 Ethical Considerations

Monitoring social media conversations raises two important questions about a) the protection of privacy, and b) ethical concerns. The growth of interest in social media monitoring has

triggered a new debate about ethics, which centers on what is in the public domain and what is not (Poynter, 2010).

Privacy is a big issue, and social networking sites are under public criticism for lax attitudes regarding the security and respect of users' privacy (Wakefield, 2011). It is the responsibility of the market researcher to protect a respondent's identity and not disclose it to external audiences (Malhotra et al, 2007). Social media monitoring offers a rich volume of data, however the Internet is largely unregulated. The data of users around the world is stored on servers in the US and completely available to the US authorities. What might seem legal to the researcher may not necessarily be deemed morally right by society. Public interactions in social media are available for anyone and can be assigned to a personal IP address, geographic location, language, date and even specific computer. For the purposes of this research, no personal data has been extracted. The IP addresses and geographic locations have not been stored in the excel exports as it is not necessary for the purpose of the research. A unique post ID identifies each post.

EMPIRICAL FINDINGS

The following findings start with an overview of the networks used by the anti-vaccination community. Trends in volume and engagement are outlined in 5.1. In 5.2, clusters of common belief of the anti-vaccination sentiment are categorized and explained. The importance of influence in the anti-vaccination discussion is illustrated 5.3 because it is critical to understand that communication needs require adjustment to each country or region, which itself can present a challenge.

5.1 Networks: Volume and Engagement

During May to July 2012, the researchers recorded messages with anti-vaccination sentiment from 22,349 participants. The majority of participants spoke English, followed by Polish, Russian and Romanian.

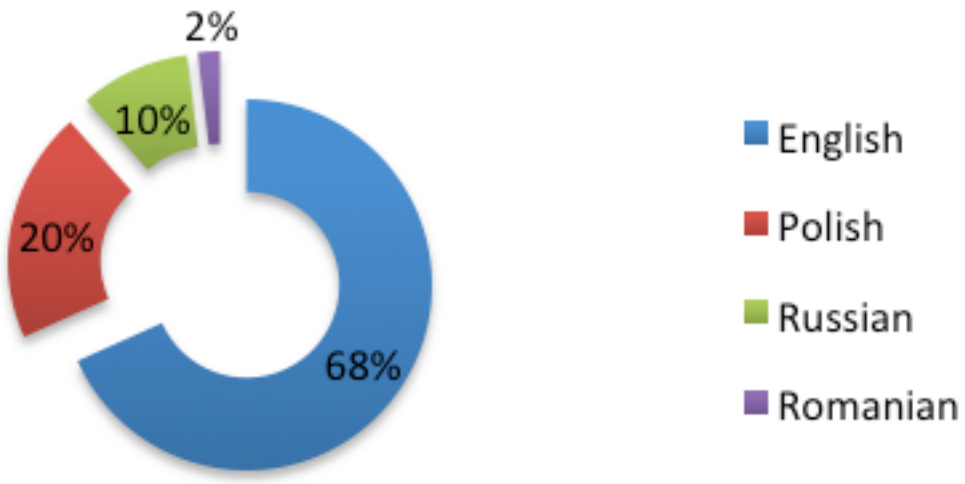


Figure 2: Participants of anti-vaccination discussions per language.

Across all four researched languages, blogs are the most frequently used channel for posting anti-vaccination content in social media. Blog is short for weblog, which is a website normally maintained by an individual (or group of individuals) and updated with regular entries. Entries are typically displayed in chronological order and tagged with relevant keywords and phrases. Blog visitors usually have the opportunity comment and share the content on blogs. Blogs are by far the most important channel in terms of volume of posts in Romanian (86% of all posts) and Polish (85% of all posts). In Russian discussions, 65% of all posts are submitted on blogs and in English nearly half of the anti-vaccination content (47%) is posted on blogs.

Facebook is the second largest channel in terms of volume of posts. The social network has a share of 25% in English speaking networks, 13% in Polish, 8% in Romanian, and 5% in Russian channels. Facebook allows users to build personal profiles accessible to other users for exchange of personal content and communication via the Facebook. Twitter, which allows users to send brief (<140 character-long) updates, is the second largest channel in Russian-speaking (24% of the total volume) and fourth with 5% in English-speaking anti-vaccination communities. Other channels to consider are News websites and Forums in which users post comments to engage in discussions about specific topics.

Since 68% of all participants in the anti-vaccination discussions during the observed time-period speak English, the dataset is able to reveal more accurate insights into demographics compared to the other languages. Insights in all languages can be found in Appendix 4, while the following analysis focuses on the English

data set.The English dataset also reveals that blogs have generally the highest rates of mentions (61%), conversations (67%), posts (67%) and interactions (43%).

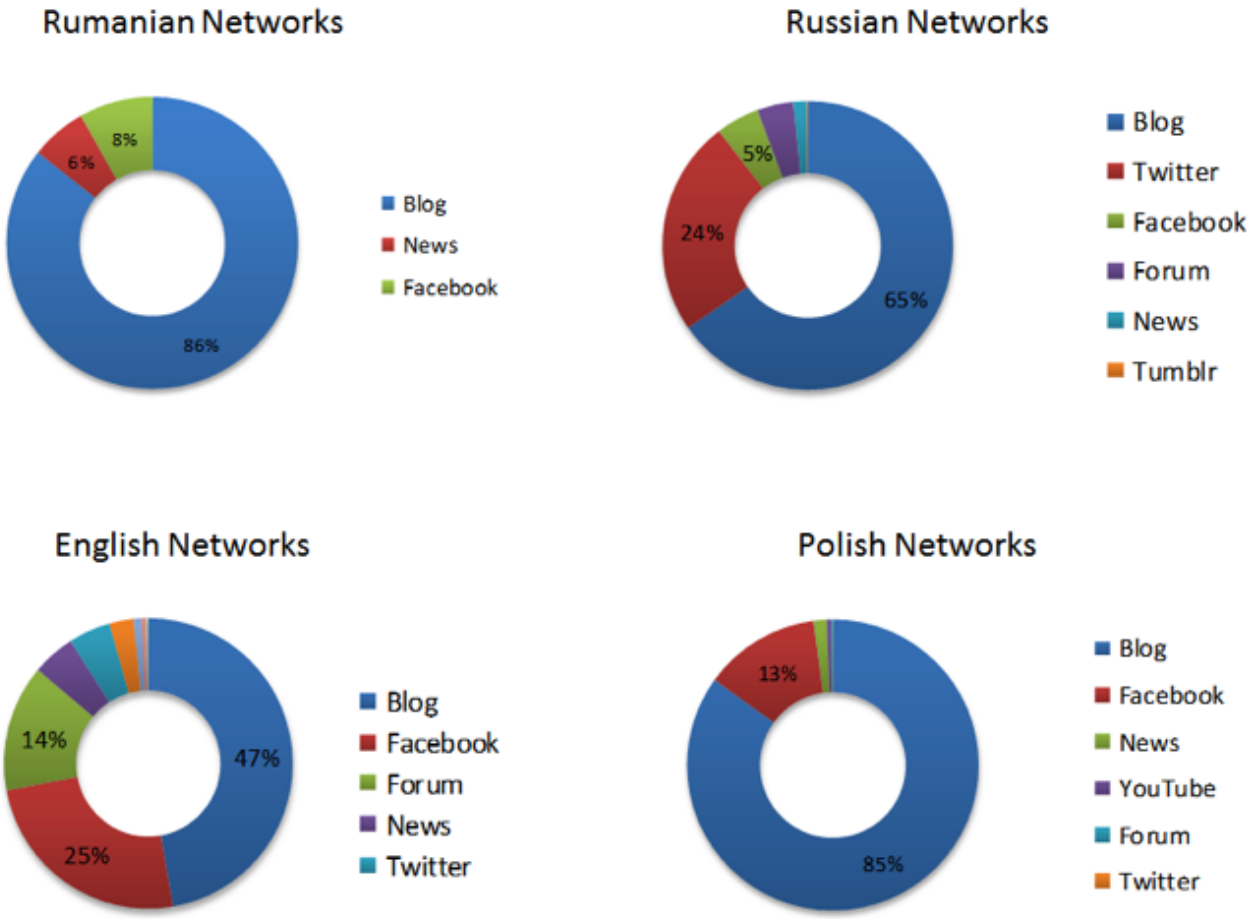


Figure 3: Distribution by channel for Romanian, Russian, English and Polish networks

Based on the volume of posts, it is a logical consequence that most engagement takes place on blogs. Engagement is defined as followed:

- *Post:* An initial message submitted to a social networking site, i.e. a blog post, Facebook status, tweet, video, etc.
- *Interaction:* Any activity created as a direct response to an initial post, i.e. comments, likes, retweets, @replies, etc.
- *Conversation:* The sum of a post and all its related interactions. Note: a post with at least one interaction is considered as conversation.
- *Mention:* An appearance of search terms in a public social media space.

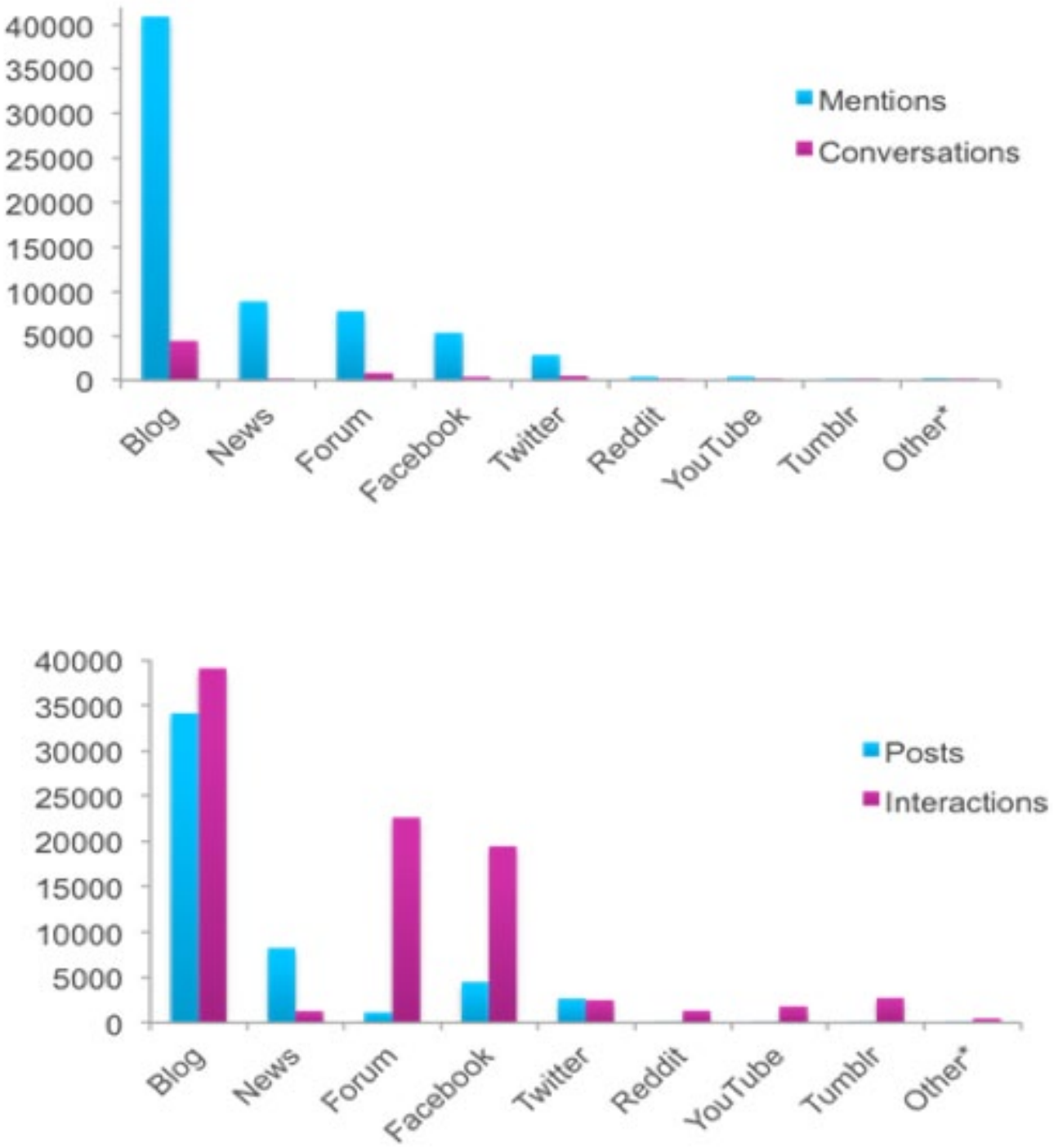
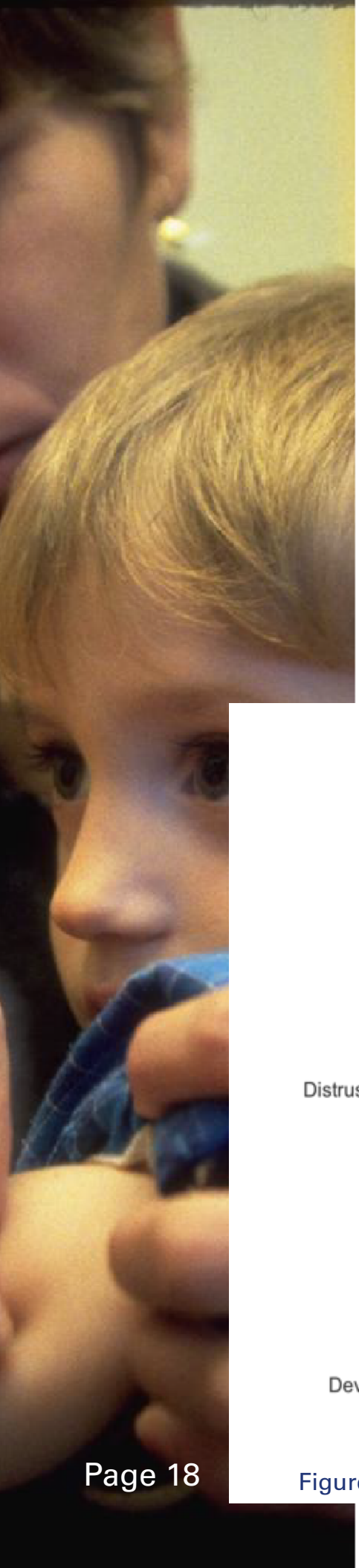


Figure 4: Mentions, Conversations, Posts and Interactions per channel.

Blogs, forums, and Facebook are the leading networks for anti-vaccination discussions in English during the observed time-period. In other words, the anti-vaccination sentiments are expressed on those platforms through posting user-generated content. However, while conversations on forums only makeup 2% of total conversations, they account for 25% of all interactions among users. This indicates a heavily engaged audience. It can



be argued that opinions are formed during interactions among users and therefore, it is vital to add pro-vaccination content to the discussions on forums. Similarly, Facebook only contains 9% of conversations, but 21% of interactions. Both channels are important to consider for interactions with the anti-vaccination sentiment even if more posts occur on blogs.

Similar findings occur in Forums. Forums are designed to be interactive conversation, where topics are discussed in greater depth.The English dataset is a reflection of this distinguish feature 16% of all posts and 25% of all interaction occur on Forums. The figures show that while the volume of content on Forums is relatively low, the engagement is an important strength that shaped the opinion in the anti-vaccination community.

Figure 5 indicates that the data skews towards female audiences when issues such as developmental disabilities (59%), chemicals and toxins (56%) and side effects (54%) are discussed within the anti-vaccination sentiment, whereas men focus on arguments around conspiracy theory (63%) and religious/ethical beliefs (58%). Anti-vaccination social media participants are approximately 56% female and 44% male.

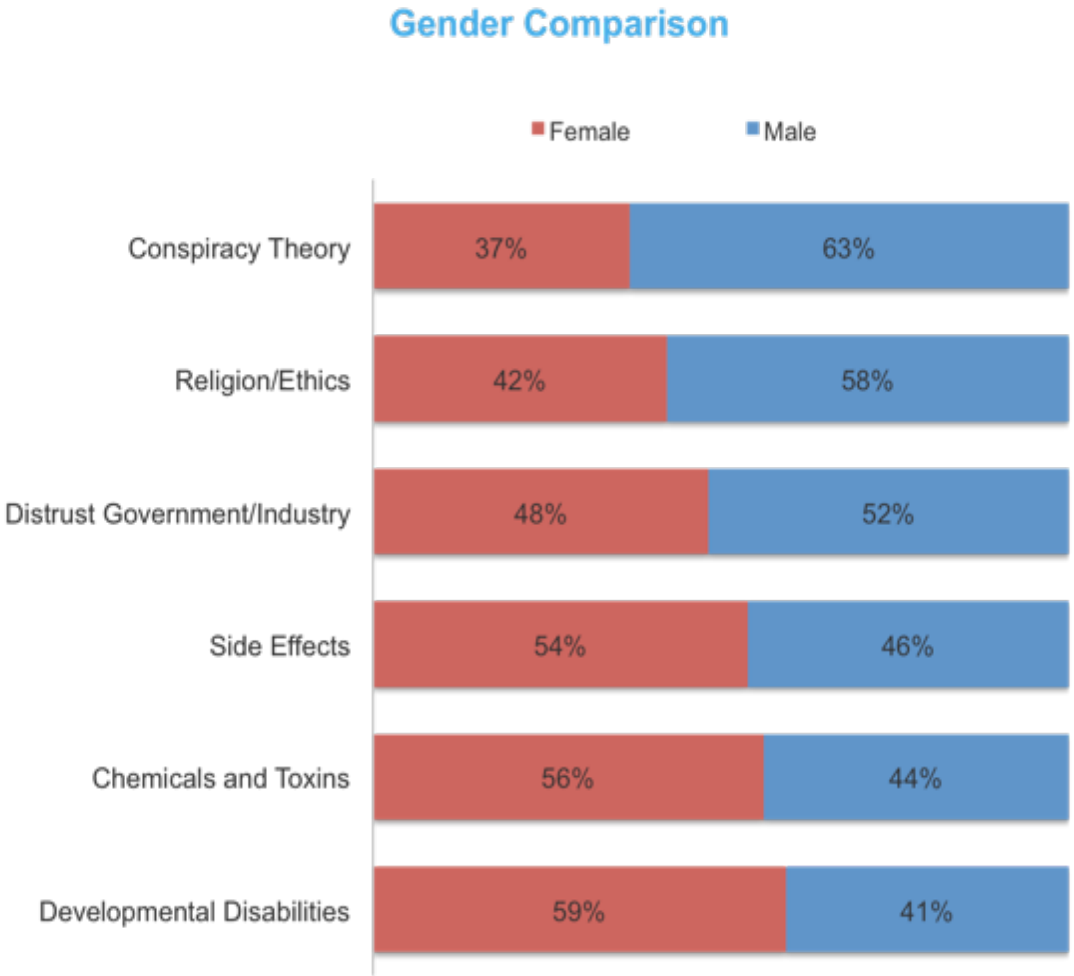


Figure 5: Gender comparison in English per argument.

5.2 Common Arguments

The amount of argument-mentions in anti-vaccination sentiment changes significantly by language during the observed time-period. Figure 6 illustrates that conspiracy theory and religious/ethical beliefs are the main topic trends in English, while religious/ethical beliefs drive the majority of discussions in Russian speaking anti-vaccination discussions. Polish anti-vaccination discussions are driven by arguments about side effects and chemicals and toxins in vaccines. The issue of chemicals and toxins is the major driver in Romanian discussions during the observed time-period. The arguments are described in detail in the following sections. The categories are based on keyword strings that were narrowed down over time. Issues should not be regarded in a static way, they might overlap and are interconnected.

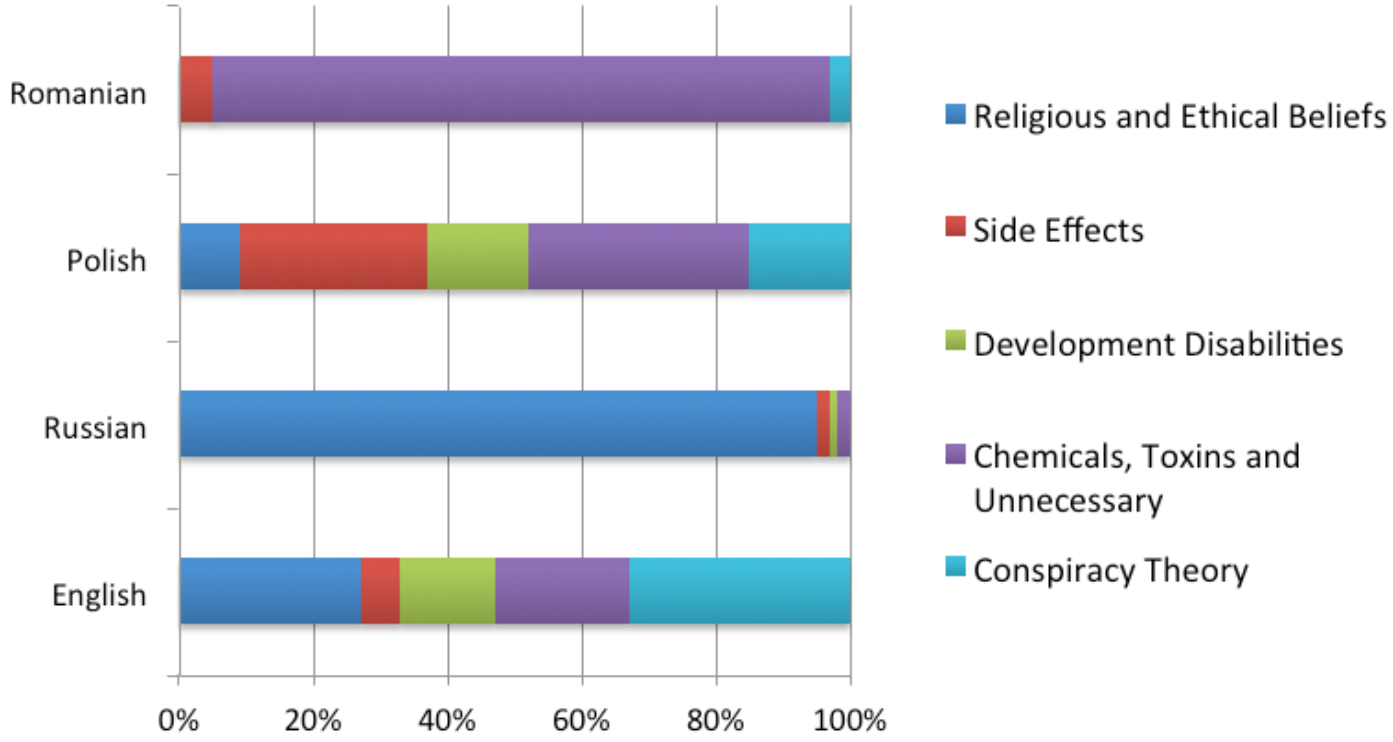


Figure 6: Allocation of arguments by language for the anti-vaccination sentiment.

5.2.1 Religious and Ethical Beliefs

Religious and ethical discussions are especially active in discussion in Russian, with 96% of all anti-vaccination discussions focused on that issue. In English discussions, 32% of all anti-vaccination discussion use religious and ethical arguments. The arguments are less relevant in Polish (5%) and Romanian (0%) speaking anti-vaccination discussions. The main train of thought derives from

the belief that humans are created just as they should be and external interference is not required. "My body was designed by God to be self healing and self regulating and no man will be able to do better than God" is a quote by a female blog commentator from the US. Another user states, "…anything that involves substances that should never belong in a humans' body, should not be injected or consumed without that individuals' consent."

Anti-vaccination advocates believe in homeopathy and alternative medicine. "…My Body…My Decision…" writes a community member from Australia. A broad sentiment that mandatory vaccination is a violation of human rights can also be detected. From an ethical standpoint, the anti-vaccination community claims that it is a basic human right to be free from unwanted medical interventions, like vaccine injections. The same kind of argumentation can be recorded in all four languages.

On June 15th 2012, the Polish Parliament voted to change the existing laws on vaccinations. The Act on Preventing and Fighting Infections and Infectious Diseases in Humans and in The Act on National Sanitary Inspection has created controversy among social media users because of it makes vaccination mandatory. The anti-vaccination advocates were sending petitions to the Polish President demanding him to stop the act. The petition received support from some representatives of the Catholic Church, but not an official support from the church as whole. Radio Maryja, the most powerful independent catholic media in the country, also critiqued the act based upon:

- The argument that vaccines are made based on cell lines derived from the bodies of babies killed by abortion.
- The notion of unethical activities by campaigning teenagers and women to be vaccinated against HPV infection and it is "promoting immoral, and disorderly behaviour in the area of sexuality."

5.2.2 Safety and efficacy

Side effects are the most common anti-vaccination theme in Polish networks (28%), but they also play a role in English networks (9%) and Romanian (5%). The argument is mentioned in less than 1% of all anti-vaccination discussions in Russian language. Typically, parents who reach out to online communities because they are unsure about vaccines trigger the discussions about side effects. Individual stories from parents are powerful because they humanize the discussion. One user writes, "My baby is 5 months old, not vaccinated and he is going through pertussis right now! It's very scary! I HATE it! I have 3 children, the other 2 were vaccinated but I'm scared to vaccinate my baby! Any other mommy's new at

this?" This quote reflects a level of fear and uncertainty about the right thing to do, even though the mother has experienced both the effect of vaccines and vaccine-preventable diseases. Another parent writes: "My brother, sister in law, and all three kids under the age 5 were vaccinated for whooping cough and they all got it!"

An argument in a Russian network claims that live vaccines can mutate in the organism and create deadly strains. The fear of side effects leads to discussion about vaccines causing diseases and death. A user from the UK argues, "The only way you can get this virus is if it is injected into you". Besides individual stories, argumentation backed by figures without context or sources are equally powerful in fostering fear of vaccines. For example, a member in one English network posts: "Vaccinated children have up to 500% more diseases than unvaccinated children". Community members in Russia postulate that vaccinated children get sick 2-5 times more often than non-vaccinated children. For example in Romania, school nurses perform the mandatory vaccination during class, which is seen as a human rights violation and a safety issue. Parents are sceptical about the skills of the school nurses and feel surpassed by authorities in its decision to have children vaccinated.

A user in a Polish anti-vaccination community states: "I am a mother of two disabled children. When my daughter was five months old, she had a negative reaction to the vaccine, now she has been diagnosed with autism and mental retardation. For 10 years, I did not vaccinate my children and I would not want the right to decide on this matter taken away from me. I am an educated person, and have researched the subject and do not believe in the efficacy or safety of vaccinations."

5.2.3 Developmental Disabilities

Another reoccurring argument in the anti-vaccination sentiment claims that vaccines contain toxins and harmful ingredients. Injecting vaccines into the body of a child leads to brain injury and developmental disabilities. This theme is discussed in 15% of all English and Polish speaking anti-vaccination discussions. Development Disabilities was in less than 1% of anti-vaccination discussions mentioned in Russian or Romanian networks. The arguments evolve from sentiment surrounding vaccines posing challenges to the immune system and producing antibodies that may cause autoimmune diseases. Another notable argument is that vaccines are not able to fight off the mutant viruses that develop over time.

Across communities, anti-vaccination advocates link vaccines to

epilepsy, autism and neurodegenerative diseases (Parkinson and Alzheimer). A member of the Polish community writes: "Mercury causes developmental disorders in children (including epilepsy and autism), in adults, neurodegenerative diseases (Parkinson's and Alzheimer's), and degenerative changes in the reproductive systems of men and women, impairing their ability to reproduce offspring." It is notable that figures are used based on estimates by the author without links to sources. A Russian speaking user notes that "vaccinations against pandemic influenza H1N1, also known as 'swine', can lead to the development of Guillain-Barré syndrome, acute poliradikulita in adults, according to Canadian researchers, published in the journal JAMA".

5.2.4 Chemicals, Toxins and Unnecessary (administration of vaccines)

"Our doctor has advised us to avoid vaccines in absence of a direct disease risk, since the long-term side effects have not been studied" writes a member of an English-speaking community. One common argument recorded in the anti-vaccination sentiment is that studies about risks and impact of vaccinations are insufficient. Vaccines have not been tested enough and have concerns regarding the lack of long-term side effects studies. Another user states that "I would really want to know whether and how well vaccine manufacturers test their final vaccine products (…) and how much contamination they discover".

A common belief is that children having a vaccine-preventable illness just need food, water, and sanitation. In Polish communities, members use the example of Scandinavian countries lobbying for a ban of questionable and potentially harmful ingredients in vaccines. The notion that Scandinavian countries banned Thimerosal a long time ago and they have a much lower percentage of children with autism was classified was an important argument for users. Drawing on that example, the most common belief in Polish communities is that mercury may cause autism. A Russian-speaking user concludes, "a recent large study confirms the results of other independent observations, which compared vaccinated and unvaccinated children. They all show that vaccinated children suffer 2 to 5 times more often than non-vaccinated children". Sources or links to the recited studies are not provided.

5.2.5 Conspiracy Theory, Western Plot and Conflict of Interest

In English-speaking anti-vaccination communities (24%), a strong distrust against governments and pharmaceutical industry is

recorded. The same applies for Polish (5%), Russian (1%) and Romanian (3%) at a smaller scale. However, the U.S. and western governments are viewed critically when discussing about governments and conflict of interest. In Polish networks excessive vaccinations are seen as promoted by pharmaceutical companies in order to gain profits.

The role of the pharmaceutical industry is discussed mostly negatively. The sector is regarded as "corrupt marketing machine". An English-speaking user states that: "In the vaccine industry, scientific fraud and conflicts of interests are causing a similar cycle of deaths and injuries that is being concealed and denied by regulators and vaccine manufacturers". The industry is viewed as profit-driven and has moved from its original purpose to save lives and protect humans.

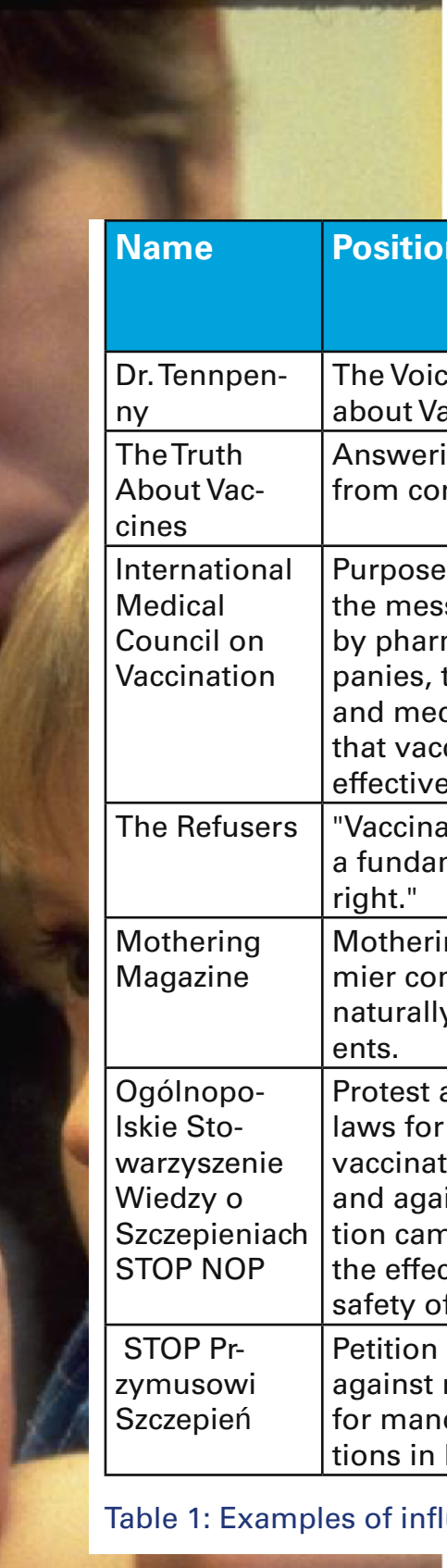
Romanian discussions directly blame the U.S. for purposefully infecting people with HIV using polio vaccines. Users create a direct link between vaccines and widespread HIV in Romanian orphanages. In the same sense, users claim that vaccines are being used against the Romanian populations. According to members of the anti-vaccination sentiment, vaccines against polio and chickenpox are used in Romania, which are not used in the U.S. anymore.

Polish anti-vaccination communities state the examples of swine flu and bird flu two years ago. According to the users, both cases are plots by giant pharmaceutical companies. Some countries desperately bought a huge quantity of vaccines, while Poland acted rationally and did not buy the vaccines, which saved the state budget a couple of billion. The activists are suspicious because the epidemic ended after the new vaccines were purchased by several governments.

The distrust against governments is also reflected in conspiracy theories. Patterns in English-speaking communities suggest that immunization is used to control and reduce the world population. One strain of argumentation is that vaccines that are not allowed in developed countries are imported to developing countries in order to reduce population growth.

5.3 Influencers

Opinion leaders in anti-vaccination sentiment show varying characteristics across countries. However, they often appear to be well educated in alternative medicine. Some have no college education; others are in the medical field (such as nurses). A high level of volume and interaction can be recorded for influencers. They often subscribe to social channels of homeopaths and



alternative medicine advocates but they can be found across platforms. The following section lists a range of influencers that are active in different channels or languages:

Name	Position	Facebook Fans	Twitter Followers	Blog	Language
Dr. Tennpenny	The Voice of Reason about Vaccines	36,282	1,475	Yes	English
The Truth About Vaccines	Answering questions from concerned parents	21,246	N/A	Yes	English
International Medical Council on Vaccination	Purpose is to counter the messages asserted by pharmaceutical companies, the government and medical agencies that vaccines are safe, effective and harmless	7,983	N/A	Yes	English
The Refusers	"Vaccination choice is a fundamental human right."	9,069	12,457	Yes	English
Mothering Magazine	Mothering is the premier community for naturally minded parents.	66,504	102,173	Yes	English
Ogólnopolskie Stowarzyszenie Wiedzy o Szczepieniach STOP NOP	Protest against new laws for mandatory vaccinations in Poland and against disinformation campaigns about the effectiveness and safety of vaccines.	3,203	N/A	Yes	Polish
STOP Przymusowi Szczepień	Petition campaign against new new laws for mandatory vaccinations in Poland.	2,866	58	Yes	Polish

Table 1: Examples of influencers in the anti-vaccination sentiment in social media.

With respect to the above-mentioned arguments, opinion leaders in the anti-vaccination movement put an emphasis on highlighting negative stories that focus on individual cases. In some cases, they blame outbreaks on "shedding" vaccinated children who get unvaccinated children sick. The argumentation is based on the conviction that vaccines are unsafe and don't work. A list of common arguments by arguments by influencers per language can be obtained in Appendix B.

DISCUSSION & RECOMMENDATIONS

In this section the research question will be discussed in light of the theoretical and empirical findings. It needs to be noted that the discussion only focuses on engagement with anti-vaccination advocates in the four researched languages. This does not include pro-vaccination movements, medical professionals, partners or others. The discussion will propose a model that illustrates the different drivers of anti-vaccination sentiment based on three elements. The recommendations section builds on the three elements of the model and provides practical advice for communication strategies.

6.1 Discussion

In order to develop engagement and messaging strategies for anti-vaccination sentiment, it is vital to have an abstract understanding of what drives users to become suspicious about vaccinations. Based on the findings, the paper proposes a model of anti-vaccination sentiment identification and salience. We classify three main spheres that attribute to a negative sentiment towards vaccine, which help us in the identification of trends within the anti-vaccination sentiment. The classification is illustrated in the following figure:

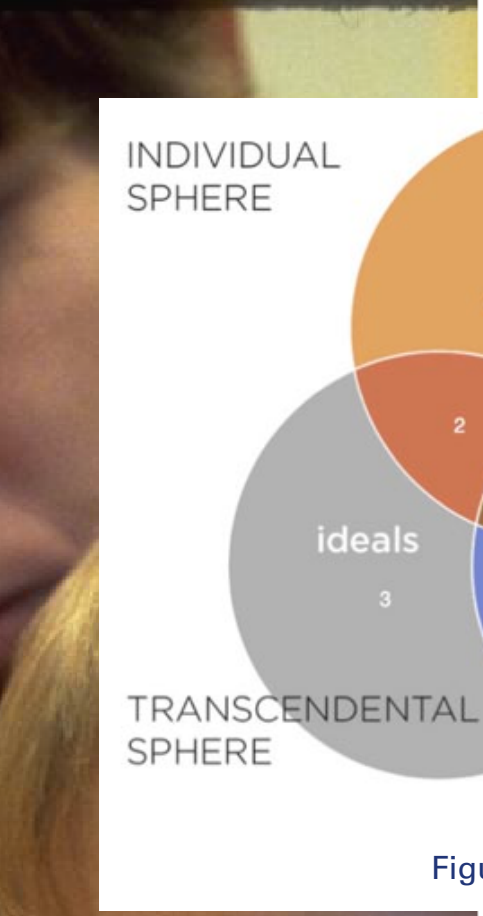


Figure 7: Model of anti-vaccination sentiment identification and salience.

The first attribute is the individual sphere. The main motivations for users to get involved are highly personal matters driven by concern and fear. When it comes to vaccinations, some parents are not sure what the right decision is. Am I a good mother if I do not get my child vaccinated or is it my responsibility as a caring parent to ensure the best protection for my child? Personal testimonies of other parents, especially negative stories, have a huge impact on the parent and fuel the concern.

The second element that characterizes the anti-vaccination sentiment is the contextual sphere. The main driver behind the contextual sphere is a distrust of governments, pharmaceutical industry, scientific bodies and international organizations. It seems to be overwhelming for parents to understand the role of the "big players". An interesting observation is that users in the contextual sphere do not seem to have a general resentment against vaccines per se but most arguments focus on lack of transparency in the decision processes as well as the potential conflict of interests trigger distrust.

The third attribute is labeled as transcendental sphere. Negative attitudes towards vaccinations are derived from idealistic, religious and ethical beliefs. Arguments are rooted in strong beliefs and appear dogmatic, such as God creates us in the most ideal way or a body has its natural balance.

Individual, contextual and transcendental sphere are the key attributes of a member of the anti-vaccination movement. We argue that the various combinations of these attributes are indicators of the salience of members. We can identify four groups that derive from Figure 3. In order to understand salience within anti-vaccination community members, we propose the following classification

- Core Members are users that apply to all three spheres. They are concerned about side effects, distrust the government and live according to strong religious or ethical beliefs.
- Intense Members are members that apply to two of the three spheres. For example, a user might have concerns about vaccinations based on an individual sphere and also carry distrust against the pharmaceutical industry. But they are not driven by any idealistic beliefs.
- Alert Members are users that apply only to one of the three spheres. The doubt about vaccines derives only from one sphere and has human characteristics. They seem to be less convinced of the harm of vaccinations than the other two member groups.

There is a fourth group of users, the Non-Members. They simply do not apply to any of the classification. We argue that Alert Members are easier to convince of the necessity of vaccines than Intense Members. Core Members are the hardest to convince, because the arguments against vaccines are based on various foundations. The findings also show that the intensity of argumentation, the interaction and the volume varies between the spheres. Therefore, the next section outlines practical recommendation on how to draft engagement strategies for each sphere.

6.2 Recommendations

The following graphic summarizes the framework for the engagement and messaging plan that enables communication officers and health workers to react to the anti-vaccination sentiments. The framework is designed to be customizable for local realities. However, it does provide an overarching guidance for communication and campaigning initiatives.

Members of the individual sphere should be approached with an emotional appeal. Users in this sphere go online and search for information in order to make an informed decision. Content that encourages parents to get their children vaccinated needs to be easy to find. Hence, search engine optimization plays an important role in the outreach strategy. Search marketing is used to gain visibility on search engines when users search for terms that relate to immunization. In order to appear on top if the search

results two general approaches should be considers:

- Organic search (SEO): When you immunization or vaccines into a search engine like Google or Yahoo!, vthe organic results are displayed in the main space of the results-page. For example, when parents search for information about vaccinations, pro-vaccine information should rank on top of the search engine results. By "optimizing" websites and posts, organizations and governments can improve the ranking for important search terms and phrases ("keywords"). Engaging actively in discussion and providing links to pro-vaccination content also helps to increase the visibility in the ranking.
- Paid search (SEM) enables to buy space in the "sponsored" area of a search engine. There are a variety of paid search programs, but the most common is called pay-per-click (PPC), meaning the information provider only pays for a listing when a user clicks the ad.

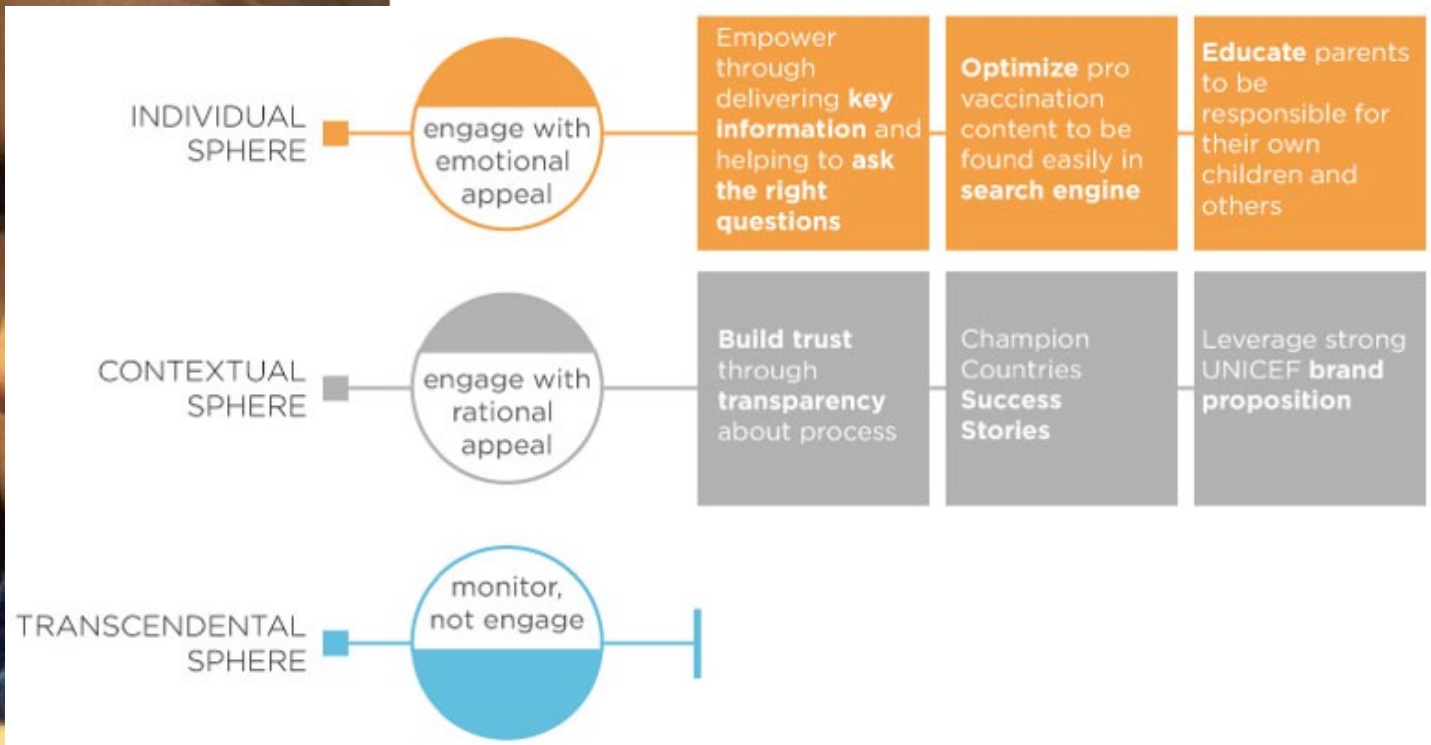


Figure 8: Engagement Matrix for core spheres of the anti-vaccination movement.

The emphasis of the content strategy is to empower parents to ask doctors the right question in order to build confidence for the decision making process. Rather than criticising parents' choices not to vaccinate, the messaging should promote an individual's ability to make the world a safer place for children. The communication strategy should also highlight the individual right and responsibility to choose to vaccinate. Through emotional

messaging, hesitating parents should receive key information and explain how their choices affect their own children and the ones of others.

The communities in the contextual sphere source their scepticism from general distrust against the large players involved in the vaccination industry. The engagement strategy should be based on a rational appeal that focuses on the hard facts of vaccines. It is important to avoid obvious communication tactics. Transparency about vaccines, testing, ingredients, potential side effects, funding and preventable diseases is crucial to reduce distrust. The messaging should also take into account past errors in vaccine campaigns by governments and suppliers in the regions and most importantly focus on the lessons learnt and how processes have been improving since then. Transparency can be built through a multi-channel approach that features the development of vaccines with expert testimonies.

Successful cases, such as the near eradication of polio as a global effort, help to reduce distrust as well. This can be backed by official statistics on how infant mortality rates have been reduced over the past 20 years. Countries that generally have a favourable public perception, such as Scandinavian countries, should be used. However, the example of champion countries should be adjusted to regional communication campaigns. UNICEF has a favourable perception throughout the findings compared to governments, industry and other international organizations / UN entities. Leveraging on UNICEF's commitment to helping children around the world has the potential to spill over to other actors in the vaccination process. The strong brand value should also be used to combat the "western plot" sentiment by approaching the discussion through focussing on children rather than on politics.

The transcendental sphere is characterized by deeply rooted beliefs and lifestyles. The findings reveal that this sphere is the least open to dialogue. The recommendations focus on monitoring trends in the sphere but not engaging with it. The recorded discussions show that arguments are broad in nature and other opinions rarely accepted.

As social media continuously evolves, it can be expected that the ways the anti-vaccination advocates interact in social media, as consumers and providers of information, will constantly change in terms of channels and tactics. The discussion on social networks, will continue to offer an interesting and rich set of data that offers insights about individuals, groups, issue trends, opinions, sentiments and influence. This research is a first attempt in aligning social media monitoring findings with practical outreach and communication for development as well as risk communication initiatives in the field.

In order to turn the insights into actions in the region, we propose the discussion of the findings by communication and health/ immunization focal points in relevant meetings and events. In addition, the study could be used to integrate social media and anti-vaccine related issues in the trainings of UNICEF staff and government counterparts, including issues like:

- Building understanding and comfort of use with common social and digital channels used by anti-vaccination advocates.
- Developing an understanding of user-behaviour in seeking information through social and digital channels.
- Integrating engagement strategies based on the recommendations and findings that enable communication officers deliver content that builds a contrast to the anti-vaccination sentiment.

In the mid-term, follow up studies and impact analysis is paramount in order to measure impact and emerging trends within the anti-vaccination sentiment. On-going monitoring of social media should also be conducted, although feasible mechanisms for doing the same need to be recommended. Trainings in conducting social media monitoring could be an immediate concrete follow-up.

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Authors:

UNICEF New York, Division of Communication, Social and Civic Media Section: Sebastian Majewski, Gerrit Beger.

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APPENDIX

Appendix A: Keyword Strings in English language

Anti-Vaccination

(antivaccinate OR antivaccination OR "anti vaccination" OR [anti-vaccination] OR [anti-immunisation] OR [anti-immunization] OR "anti immunization" OR "anti immunisation" OR [anti-vaccine] OR antivaccine OR "anti vaccine" OR "refuse vaccine"~3 OR "vaccine refusal" OR "refuse vaccination"~3 OR "refuse immunization"~5 OR "refuse immunisation"~5 OR "deny vaccine"~5 OR "do not vaccinate" OR "wont vaccinate" OR "refuse shots"~3 OR "deny shots"~3 OR "wont vaccinate" OR "do not take vaccine" OR "dont get vaccine" OR "do not get vaccinate" OR "do not get vaccinated" OR "dont vaccine"~5 OR "dont vaccinate" OR "dont immunize" OR "vaccination denial" OR "anti vaccinationist" OR "vaccine refuse" OR "vaccine refusers" OR "anti vax" OR antivax OR [anti-vax] OR antivaxers OR antivaxxers OR antivaccinationism OR [anti-vaccinationsim] OR unvaxed OR unvaccinated OR unvaccinated) AND "for children" OR "for kids" OR "for infants" OR toddlers OR "young children" OR unicef

Side effects

"side effects are dangerous" OR "not worth the side effects" OR "too many side effects" OR " many unknown consequences" OR "too many unknown side effects" OR "harmful side effects" OR "dangerous side effects" OR "dangerous complications" OR "dangerous adverse reactions" OR "many adverse reactions" OR "harmful side effects" OR "vaccines are not safe" OR "vaccines are unsafe" OR "inject toxic chemicals" OR "Vaccines contain mercury" OR "vaccines have toxins" OR "cause neurological damage" OR "lead to neurological damage" AND (vaccine OR vaccines OR vaccination OR vaccinated OR immunization OR "tetanus shot" OR "polio shot" OR "mmr shot" OR immunisation OR inoculation)

Efficacy

"no scientific evidence that vaccines work" OR "vaccines are not proven to work" OR "vaccines dont work" OR "no scientific proof that vaccines work" OR "vaccines are not effective" OR "vaccines arent effective" OR "vaccines are a hoax" OR ("No proof that they

work" AND (vaccine OR vaccination)) OR "No proof that vaccines are effective" OR ("No conclusive studies" AND vaccine)

Unnecessary

"vaccines unnecessary"~5 OR "vaccination unnecessary"~5 OR "vaccine is not necessary" OR "vaccines are not necessary" OR "vaccination is not necessary" OR "dont need vaccination" OR "dont need vaccine" OR "dont need vaccines" OR "dont need vaccination" OR "disease safer than vaccine" OR "disease safer than vaccination" OR "vaccination worse than disease" OR "vaccine worse than disease" OR "disease more safe than vaccine" OR "vaccine is more dangerous than disease" OR "immunity stronger without vaccine" OR "immunity stronger than vaccination" OR "immune system stronger without vaccine" OR "immune system stronger without vaccination" AND kids OR children OR child OR childhood

Religion/Ethics

"vaccine immoral"~5 OR "vaccination immoral"~5 OR "vaccines unethical"~5 OR "vaccines are against god" OR "vaccination is against god" OR "vaccines are against the lord" OR "vaccination is against the lord" OR "god vaccine"~5 OR "lord vaccine"~5 OR "religion vaccine"~5 OR "god vaccination"~5 OR "lord vaccination" OR ("against religion"~3 AND vaccine) OR ("mix human and animal blood" AND vaccine) OR ("not allowed in Sharia" AND (vaccine OR vaccination)) OR ("not sanctioned by the church" AND (vaccine OR vaccination)) OR ("violate rights"~5 AND (vaccine OR vaccination)) OR ("violates religion" AND (vaccine OR vaccination)) OR ("against church"~3 AND (vaccine OR vaccination)) OR ("against bible"~3 AND (vaccine OR vaccination))

Distrust Government/Industries

(("dont trust" OR "cant trust" OR "dont believe" OR "dont trust" OR untrustworthy) AND ("vaccine industry" OR "vaccine propaganda" OR "vaccine mythology")) OR "mandatory vaccines violate rights" OR ("big pharma" AND (vaccine OR vaccination)) OR ("pushing shots" AND (vaccine OR vaccination)) OR ("have their eyes closed" AND (vaccine OR vaccination)) OR ("dont believe the medical establishment" AND (vaccine OR vaccination)) OR ("dont trust government" AND (vaccine OR vaccination)) OR ("do not trust government" AND (vaccine OR vaccination)) OR ("cant trust the government" AND (vaccine OR vaccination)) OR ("dont trust medical institution" AND (vaccine OR vaccination)) OR ("government untrustworthy" AND (vaccine OR vaccination)) OR ("cant trust medical institution" AND (vaccine OR vaccination)) OR

("cant trust medical community" AND (vaccine OR vaccination)) OR ("cant trust doctors" AND (vaccine OR vaccination)) OR ("cant trust pharmaceutical industry" AND (vaccine OR vaccination)) OR ("cant trust pharmaceutical companies" AND (vaccine OR vaccination)) OR ("government untrustworthy" AND vaccine) OR ("distrust government" AND vaccine) OR ("cant trust pharmaceutical industry" AND (vaccine OR vaccination)) OR ("dont trust medical industry" AND (vaccine OR vaccination)) OR ("dont trust doctors" AND (vaccine OR vaccination)) OR ("dont trust medical establishment" AND (vaccine OR vaccination)) OR ("cant trust medical establishment" AND (vaccine OR vaccination))

Chemicals/Non-natural

"vaccines poison"~5 OR "vaccine poisonous"~5 OR "harmful chemicals in vaccine" OR "harmful ingredients in vaccine" OR "vaccines are unnatural" OR "vaccination is unnatural" OR "vaccine toxic"~5 OR "vaccine toxins"~5 OR ("unnatural ingredients" AND vaccine) OR ("toxic chemicals" AND vaccine) OR "vaccines are not natural" OR "vaccination is not natural"

"Western Plot"

"western plot" OR "plot against us" OR "plot to destroy us" OR "plot against us" AND ("vaccine industry" OR vaccination OR vaccines OR inoculation)

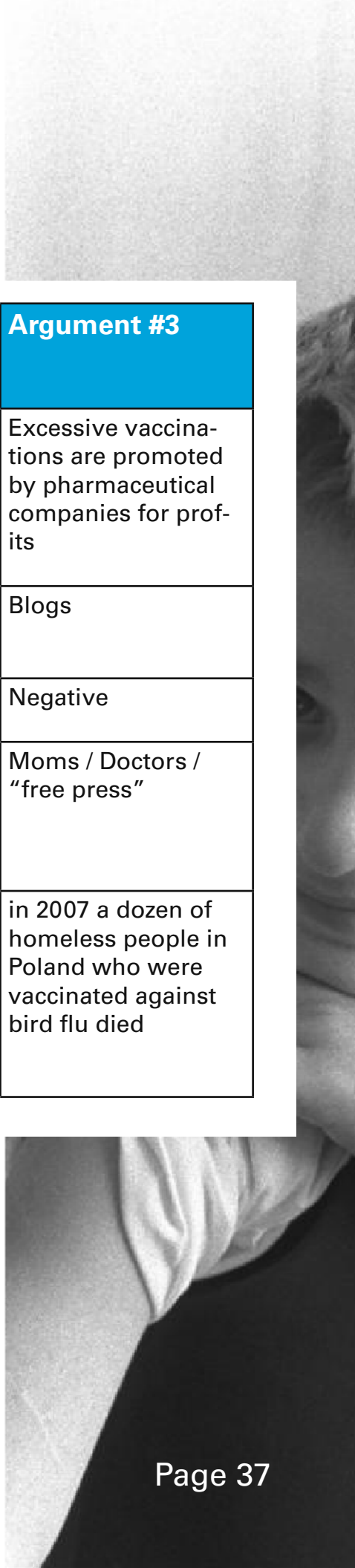
Developmental disabilities

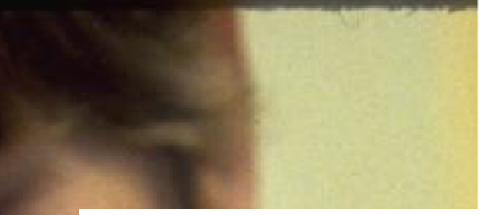
"vaccines lead to autism" OR "vaccines cause autism" OR "vaccines lead to retardation" OR "vaccines cause retardation" OR "vaccination causes retardation" OR "vaccination leads to autism" OR "vaccination causes autism" OR "vaccines lead to developmental disabilities" OR "vaccination leads to developmental disabilities" OR "vaccines cause developmental disabilities" OR "vaccines lead to developmental problems" OR "vaccines casue developmental disability" OR "vaccines lead to development problems" OR "vaccines cause development problems" OR "vaccines can make you mentally retarded"

Appendix B: Influencers by language

Common arguments by influencers: Polish speaking

	Argument #1	Argument #2	Argument #3
Description	Vaccines challenge the immune system to produce antibodies and it may cause autoimmune diseases	Some vaccines are of questionable quality and may be harmful (toxic additives).	Excessive vaccinations are promoted by pharmaceutical companies for profits
Social Networks	Blogs / Forums	Blogs / Facebook / YouTube	Blogs
Tone/Language/Attitude	Negative	Negative	Negative
Influencers	"free press" / moms	M. D. Majewska, Ph.D., EC, Institute of Psychiatry and Neurology / doctors / moms	Moms / Doctors / "free press"
Notable Mentions	Vaccine or your Health - the choice is yours / Vaccines are not able to fight off the mutant viruses.	Scandinavian countries banned Thimerosal a long time ago and they have a much lower percentage of children with autism	in 2007 a dozen of homeless people in Poland who were vaccinated against bird flu died



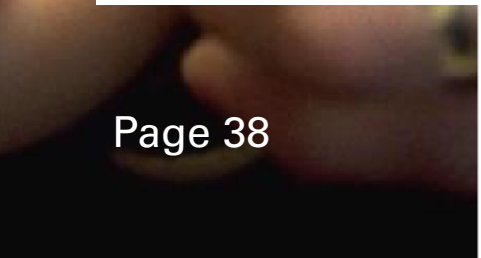


Common arguments by influencers: Russian speaking

	Argument #1	Argument #2	Argument #3
Description	Live vaccines can mutate in the organism and create deadly strains	Vaccinated children get sick 2-5 times more often than non-vaccinated	HPV vaccine can lead to autism
Social Networks	Blogs, news portals	News portals	blogs
Tone/Language	negative	negative	negative
Notable Mentions	Deadly strains	Vaccinated children	Autism

Common arguments by influencers: Romanian speaking

	Argument #1	Argument #2	Argument #3
Description	The U.S. does not vaccinate for polio and chickenpox anymore and these vaccines cause fatalities in Romania	Vaccines cause autism	The U.S. purposefully infected people with HIV using the polio vaccine
Social Networks	Blogs	Twitter/Blogs	Blogs
Tone/Language	Negative	Negative	Negative
Influencers	Moms/Doctors	Moms	Dr. Horowitz
Notable Mentions	Vaccines are being used against Romanian populations.	Using a lawsuit in Italy	Linking to the widespread of HIV in Romanian Orphanages



Influencer	Network	Description
Dr. Joseph Mercola	Facebook, Twitter, Blog	Naturopathic doctor against vaccines.
vactruth.com	Blog	"Your child. Your choice." Concern with vaccines having aborted fetal tissue, chemicals used in pesticides, and heavy metals.
Zen Gardner – Just Wondering	Blog	Conspiracies aimed at media, government, science, etc.
Dr. Tenpenny on Vaccines	Facebook	"The Voice of Reason about Vaccines," Osteopathic doctor argues that vaccines cause brain injury.
Left Brain/Right Brain	Blog	Autism news science & opinion
Thinking Moms' Revolution	Blog, Facebook	Anti-vax, parent-focused
Proud Parents of Unvaccinated Children	Facebook	Argues that vaccinated children get unvaccinated children sick, medical doctors have inadequate vaccine education, Big Pharma controls what doctors learn in medical school.
The Refusers	Facebook, Twitter, Tumblr	Anti-Vax, anti-governmental social mandates, argues that vaccines have neurotoxins that cause brain damage
Natural News	Blog	Alternative Medicine blog
Greenmedinfo.com	Blog	Alternative Medicine blog
Worldtruth.tv	Facebook, Twitter, Reddit, Digg, LInkedIn, Tumblr, Google+, Delicious, StumblrUpon, YouTube	Belief that the Pharmaceutical-Industrial Complex pushes harmful vaccines, and vaccinated kids get more sick than unvaccinated kids
Current Events & Hot Topics Forum (cafemom.com)	Forum	Vaccination studies and effects explored
VaccineInjury.info	Blog	Argues for natural immunity to regain health
EverydayHealth.com	Blog	Alternative Medicine blog

Appendix 3

Conversation Drivers

In order to understand what the user conversations are about, keyword clouds are calculated during the research. Keyword clouds enable the researcher to read the data behind the descriptive statistic. They are visual representations of the most used themes and words in the relevant discussions. Keyword clouds are used in order to understand topic trends and to simply visualize what drives anti-vaccination discussions. The bigger and more blue the word, the more often it was used.

English:

Figure 9: A keyword cloud that shows the main terms used in the anti-vaccination discussion in English speaking networks.

Polish:

Figure 10: A keyword cloud that shows the main terms used in the anti-vaccination discussion in Polish speaking networks.

Russian:

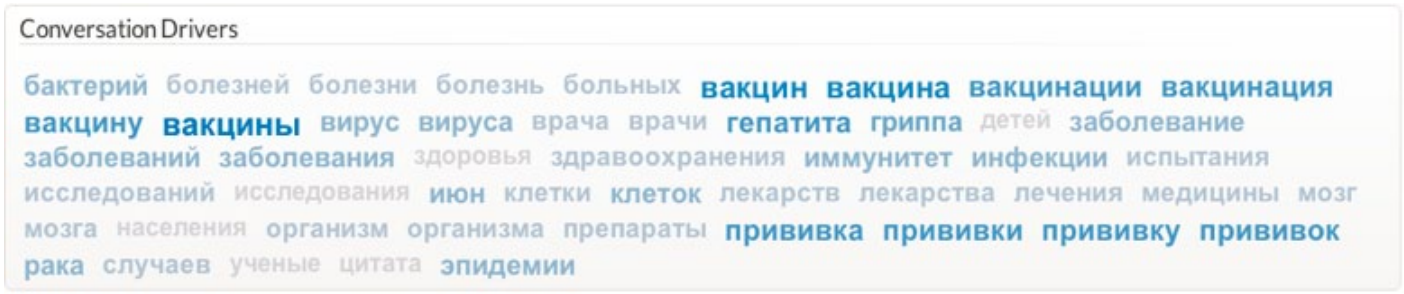


Figure 11: A keyword cloud that shows the main terms used in the anti-vaccination discussion in Russian speaking networks.

Romanian:

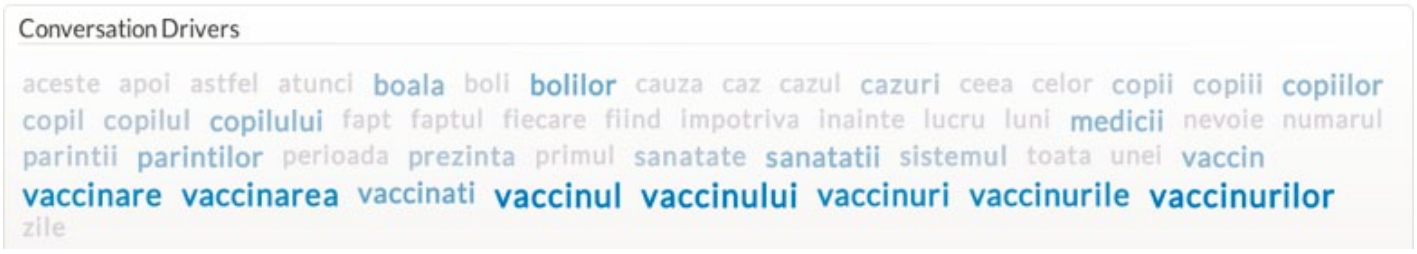
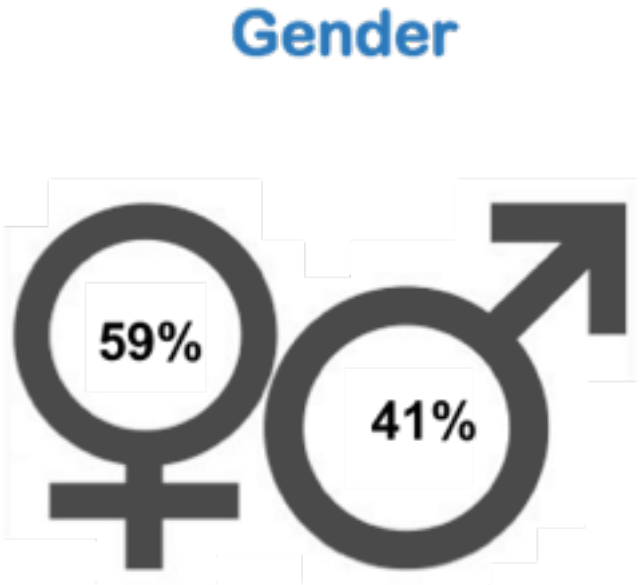
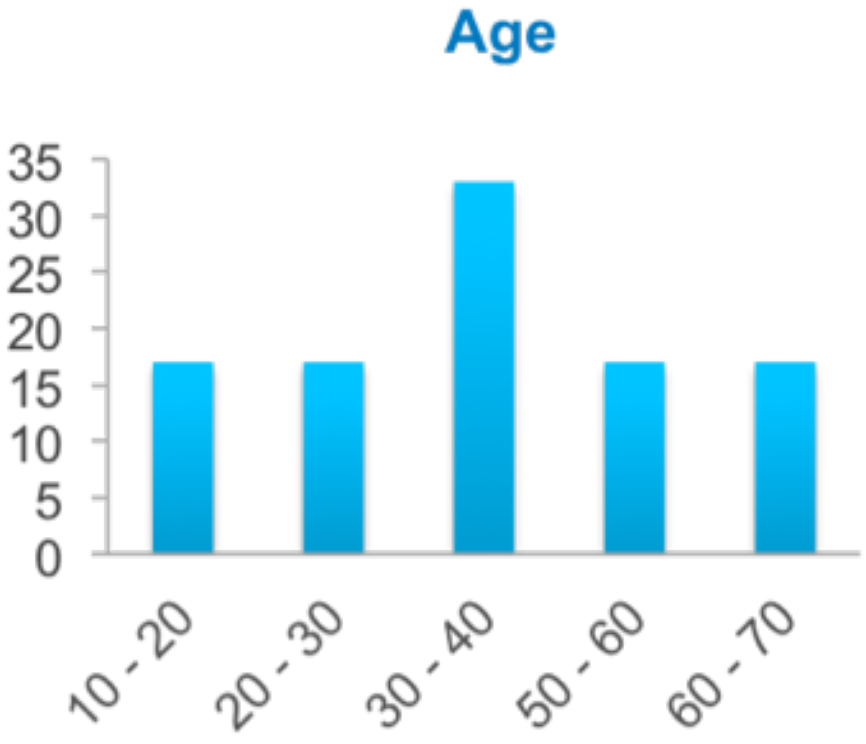


Figure 12: A keyword cloud that shows the main terms used in the anti-vaccination discussion in Romanian speaking networks

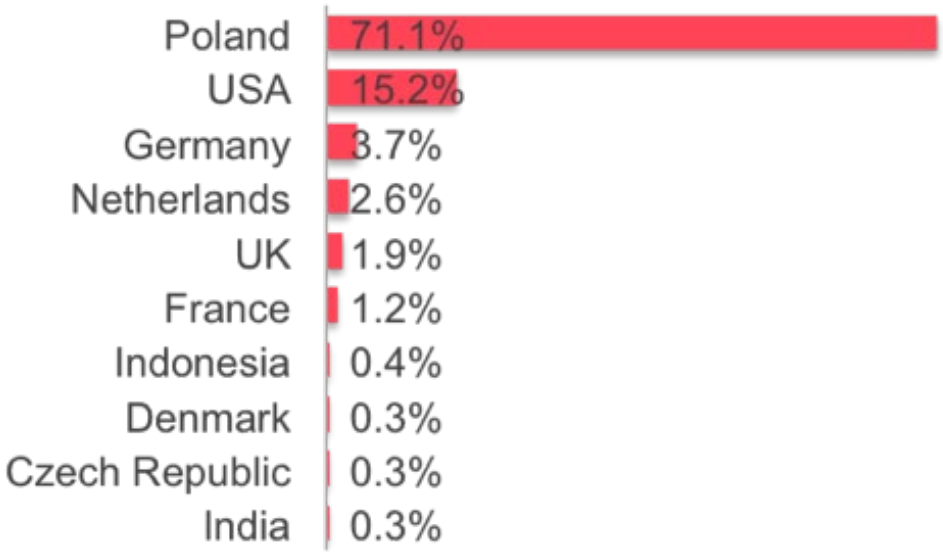
Appendix 4: Demographics

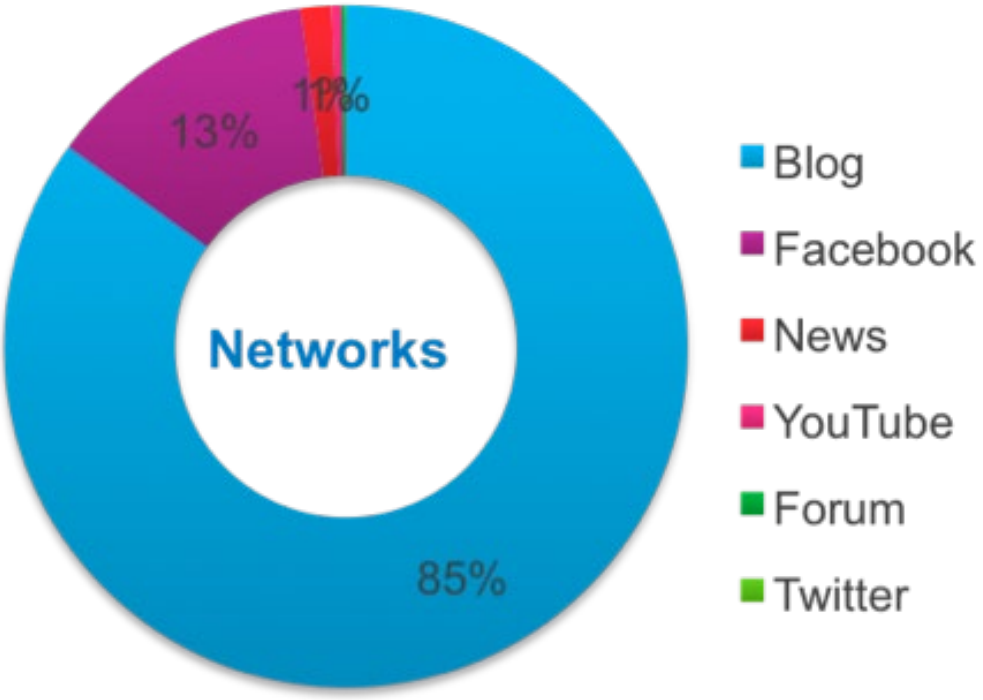
Polish:



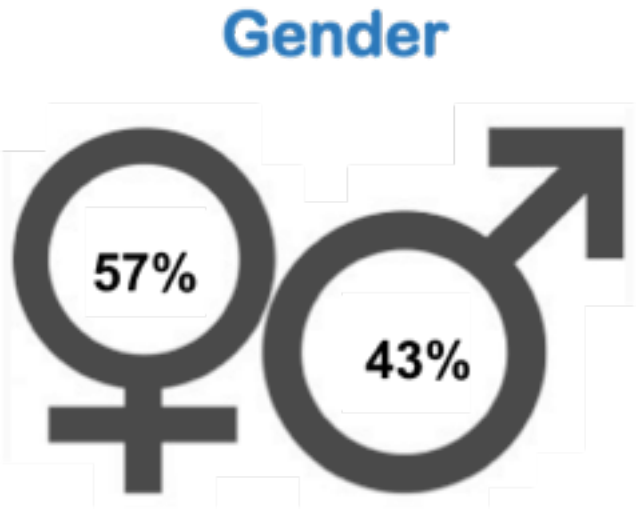


Locations


Poland 71.1%
USA 15.2%
Germany 3.7%
Netherlands 2.6%
UK 1.9%
France 1.2%
Indonesia 0.4%
Denmark 0.3%
Czech Republic 0.3%
India 0.3%


Networks
13%
1%
85%
Blog
Facebook
News
YouTube
Forum
Twitter

Russian:


Gender
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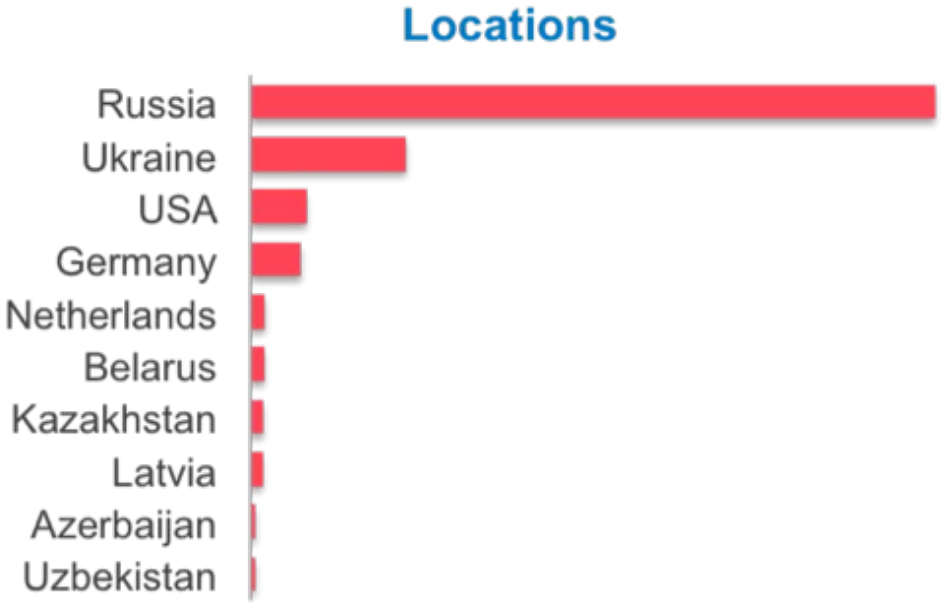
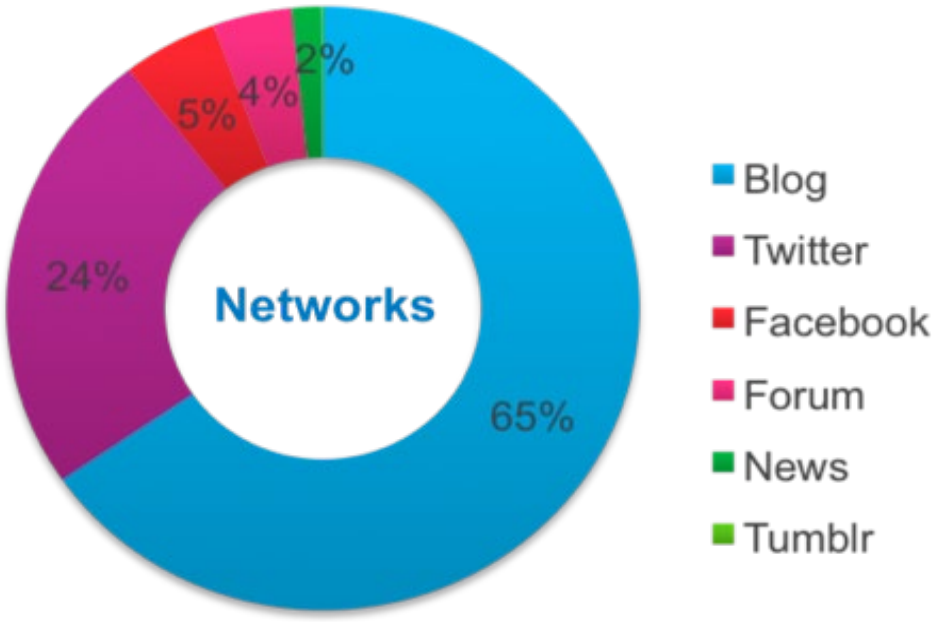
43%


Locations
Russia
Ukraine
USA
Germany
Netherlands
Belarus
Kazakhstan
Latvia
Azerbaijan
Uzbekistan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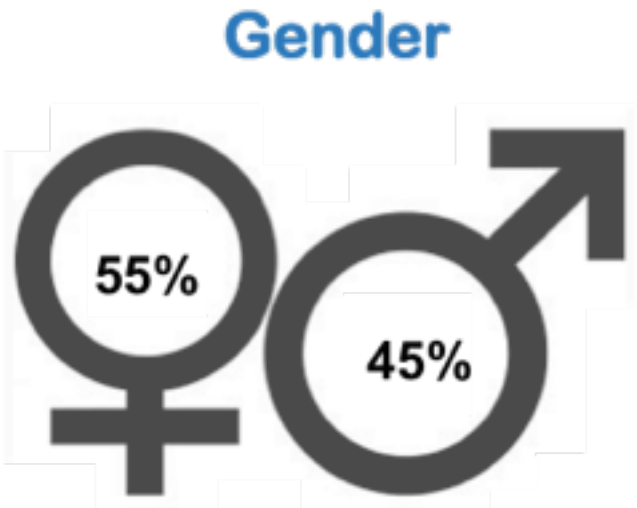
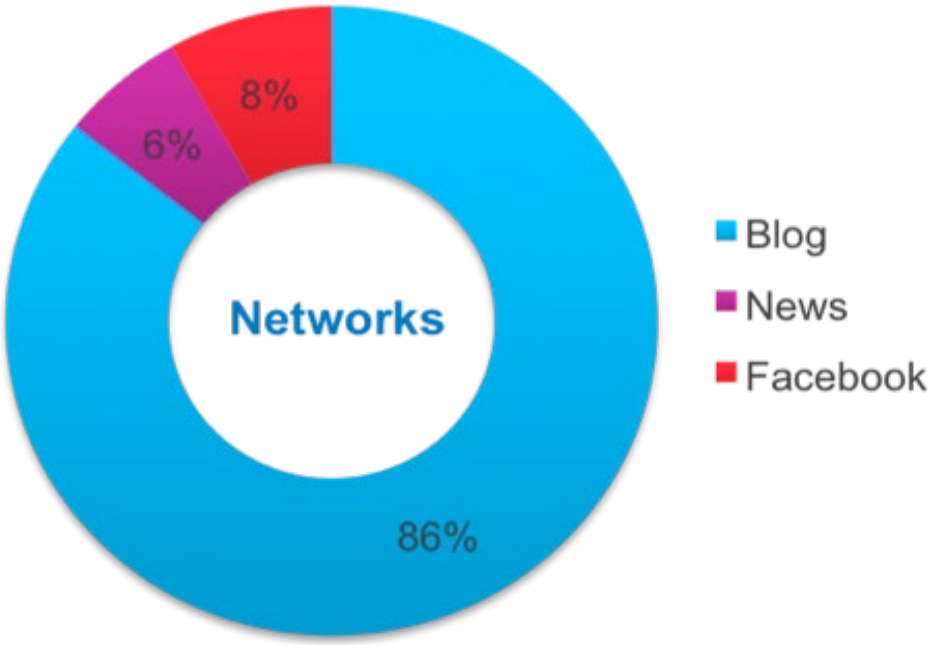
5%
4%
2%
Blog
Twitter
Facebook
Forum
News
Tumblr

\Romanian:


Gender
55%
45%


Locations
Romania
USA
Moldova
Germany
Italy
Colombia
Bulgaria
Portugal
UK


Networks
8%
6%
86%
Blog
News
Facebook

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Regional Office for Central and Eastern Europe
and the Commonwealth of Independent States

Social and Civic Media Section, DOC, NY HQ

April 2013